Ma-le'l Dunes Access Plan Project
Humboldt County, California

Preliminary Initial Study / Environmental Assessment
with
Proposed Mitigated Negative Declaration
and
Finding of No Significant Impact

Prepared for:

State Coastal Conservancy
1330 Broadway, 11th Floor
Oakland, Ca 94612

Prepared by:

HWR Engineering & Science
P.O. Box 165
Arcata, Ca 95521

Prepared in Consultation with:

U.S. Fish & Wildlife Service
Humboldt Bay National Wildlife Refuge
6800 Lanphere Road
Arcata, CA 95521

U.S. Department of the Interior
Bureau of Land Management
1695 Heindon Road
Arcata, CA 95521

Comments on this document must be submitted by March 4, 2007

Contact the State Coastal Conservancy at (510) 286-6767, BLM at (707) 825-2300, or USFWS at (707) 822-6378 for further information

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General Information About This Document

What's in this document:

The State Coastal Conservancy (SCC), Bureau of Land Management (BLM), and U. S. Fish and Wildlife Service (USFWS) have prepared this Preliminary Initial Study (IS)/Environmental Assessment (EA), which examines the potential environmental impacts of the alternatives being considered for access improvements at the Ma-le'l Dunes Cooperative Management Area, located on the north spit of Humboldt Bay. The improvements are proposed in the Ma-le'l Dunes Public Access Plan (the Plan). The IS/EA, prepared, respectively, under the California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA"), describes the Plan purpose, the need for the Plan, and alternatives, the existing environment that could be affected by the Plan, the potential impacts from each of the alternatives, and the proposed avoidance, or mitigation measures.

What you can do:

- Read this Preliminary Initial Study/Environmental Assessment. Digital copies of this document and attachments are available for review at U.S. Fish and Wildlife Services, Bureau of Land Management, Friends of the Dunes, and the State Coastal Conservancy websites. Hard Copies will be available for review at the U.S. Fish and Wildlife Services and Bureau of Land Management Arcata offices and the Humboldt County Library in Eureka, CA. CD copies of this document and attachments will also be available at the public meeting.
- Provide comments. Your comments are welcomed. If you have any comments regarding the proposed Plan and/or Prelimarily IS/EA, please submit them to Friends of the Dunes, on behalf of the State Coastal Conservancy, via any the following methods:
    - **Electronic submission**: Make comments directly to an electronic form available at Friends of the Dunes at www.friendsofthedunes.org
    - **Email submission:** Make comments via email submission to Friends of the Dunes at info@friendsofthedunes.org
    - **Fax submission:** Make comments via facsimile to Friends of the Dunes at (707) 444-0447
    - **US Mail:** Mail comments to Friends of the Dunes at PO Box 186, Arcata CA 95518

COMMENTS WILL BE RECEIVED UNTIL MARCH 4, 2007 WHICH IS 30 CALENDAR DAYS FOLLOWING RELEASE OF THIS DOCUMENT FOR PUBLIC COMMENT.

What happens next:

Comments on the IS/EA may be submitted as described above. Following close of the 30-day public comment period all substantive comments received before March 4, 2007 will be considered and the IS/EA will be revised as necessary. After such revisions, the State Coastal Conservancy, the BLM and the USFWS will make the final determination of the plan's effect on the environment. In accordance with CEQA, if no substantive comments are received during the comment period or if substantive comments are received and no unmitigatable significant adverse impacts are identified, SCC will adopt a Mitigated Negative Declaration. Similarly, if BLM and USFWS determine the action does not significantly impact the environment, each federal agency will issue a Finding of No Significant Impact (FONSI) and Decision Record based on public input in accordance with NEPA.

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Initial Study with Proposed Mitigated Negative Declaration/ Environmental Assessment

Submitted Pursuant to: (State) Division 13, California Public Resources Code

(Federal) 42 USC 4332(2)(C)

The State of California
State Coastal Conservancy

United States Fish and Wildlife Service
Humboldt Bay National Wildlife Refuge

United States Bureau of Land Management
Arcata Field Office

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Table of Contents

1.0 PURPOSE AND NEED FOR ACTION 1
1.1 Introduction 1
1.2 Background and Agency Involvement 3
1.3 Scope and Purpose for the Proposed Action 5

2.0 ALTERNATIVES INCLUDING PROPOSED ACTION 7
2.1 Description of Plan Alternatives 7
2.2 Comparison of Alternatives 14
2.3 Permits and Approvals Needed 20

3.0 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES 21
3.1 Aesthetics 21
3.2 Agricultural Resources 23
3.3 Air Quality 24
3.4 Biological Resources 26
3.5 Cultural Resources 96
3.6 Geology and Soils 100
3.7 Hazards and Hazardous Materials 104
3.8 Hydrology & Water Quality 110
3.9 Land Use and Planning 116
3.10 Mineral Resources 118
3.11 Noise 119
3.12 Population and Housing 122
3.13 Public Services 123
3.14 Access and Recreation 124
3.15 Transportation/Traffic 130
3.16 Utilities and Service Systems 134

4.0 CUMULATIVE IMPACTS 138

5.0 COMMENTS AND COORDINATION 140

6.0 MITIGATED NEGATIVE DECLARATION 141

7.0 FINDING OF NO SIGNIFICANT IMPACT 144

8.0 REFERENCES 145

9.0 APPENDICES 151

List of Figures

Figure 1. Location Map 2
Figure 2. Ma-le'l Dunes Cooperative Management Area (CMA) and Properties 4
Figure 3. Existing Features of the Ma-le'l Dunes CMA 6
Figure 4. Alternative A: The Proposed Plan 13
Figure 5. Vegetation Types at the Ma-le'l Dunes CMA 29
Figure 6. Special Status Species at the Ma-le'l Dunes CMA 44
Figure 7. Federally Listed Plant Species of the Ma-le'l Dunes CMA 64
Figure 8. Topographic Map of the Ma-le'l Dunes CMA 102

List of Tables

Table 1. Comparison of Alternatives 18
Table 2. Permits and Approvals Needed for Proposed Project 20
Table 3. Summary of Vegetation and Habitat Types and Representative Acreage for Ma-le'l Dunes CMA 30
Table 4. Special Status Species Addressed for the Ma-le'l Dunes Cooperative Management Area Public Access Plan 45
Table 5. Summary of Wetland Areas at Ma-le'l Dunes CMA 113
Table 6. Approximate Length of Trails at the Ma-le'l Dunes CMA 128

1.0 PURPOSE AND NEED FOR ACTION

1.1 Introduction

The State Coastal Conservancy (SCC), together with U.S. Fish and Wildlife Service (USFWS) and the U.S. Department of Interior- Bureau of Land Management (BLM), proposes to implement public access improvements called for in the Ma-le'l Dunes Cooperative Management Area Public Access Plan (the Plan). The Access Plan proposes actions to accommodate appropriate and orderly public access and a range of recreational opportunities designed to minimize to the extent practical any adverse impact to the natural and cultural resources of the area.

The Ma-le'l Dunes Cooperative Management Area (Ma-le'l Dunes CMA) consists of approximately 444 acres of public land owned by the BLM and USFWS. It is located approximately one mile north of the unincorporated town of Manila and 3.5 miles west of the City of Arcata, in Humboldt County, California. The area is geographically situated on the North Spit of the Humboldt Bay (also known as the Samoa Peninsula) within the Humboldt Bay dune system. Additionally, the Ma-le'l Dunes CMA stretches along 1.5 miles of the Pacific coastline. (Figure 1) The Ma-le'l Dunes CMA contains significant cultural resources and a unique association of coastal dune, forest, wetland, and estuarine ecosystems that are bordered by a number of different land uses including a public shooting range and an active lumber mill.

The Ma-le’l CMA consists of the Ma-le’l South and Ma-le’l North areas. Ma-le’l South is owned and managed by BLM and Ma-le’l North is owned and managed by the USFWS. These two areas consist of four properties known as the Manila Dunes Area of Critical Concern and the Khoaghali Parcel (Ma-le’l South) and the Fernstrom-Root Parcel and the former Buggy Club Parcel (Ma-le’l North). Ma-le’l South is currently open for public access and presently accommodates equestrian use on a designated trail and the waveslope, pedestrian use on open sandy areas and the waveslopes, unleashed dog walking in designated areas, ocean fishing, and limited vegetative gathering from March to November. The access infrastructure in Ma-l’el South consists of various signage, a gravel access road and parking area, a vault toilet, fencing delineating property lines, access gates, an unoccupied trailer pad with power and water connections and marked trails. Ma-le’l North is not yet open for public access; however, guided tours and restoration workdays have occurred monthly since fall 2005. The access infrastructure in Ma-le’l North currently consists of a gravel access road and parking area, boundary signs, limited signage and fencing, a dilapidated viewing deck, and several unmarked trails consisting of the railroad berm trail, dune overlook trail, two forest loop trails, and dune trail to the beach. There are no utilities currently working in Ma-le’l North.

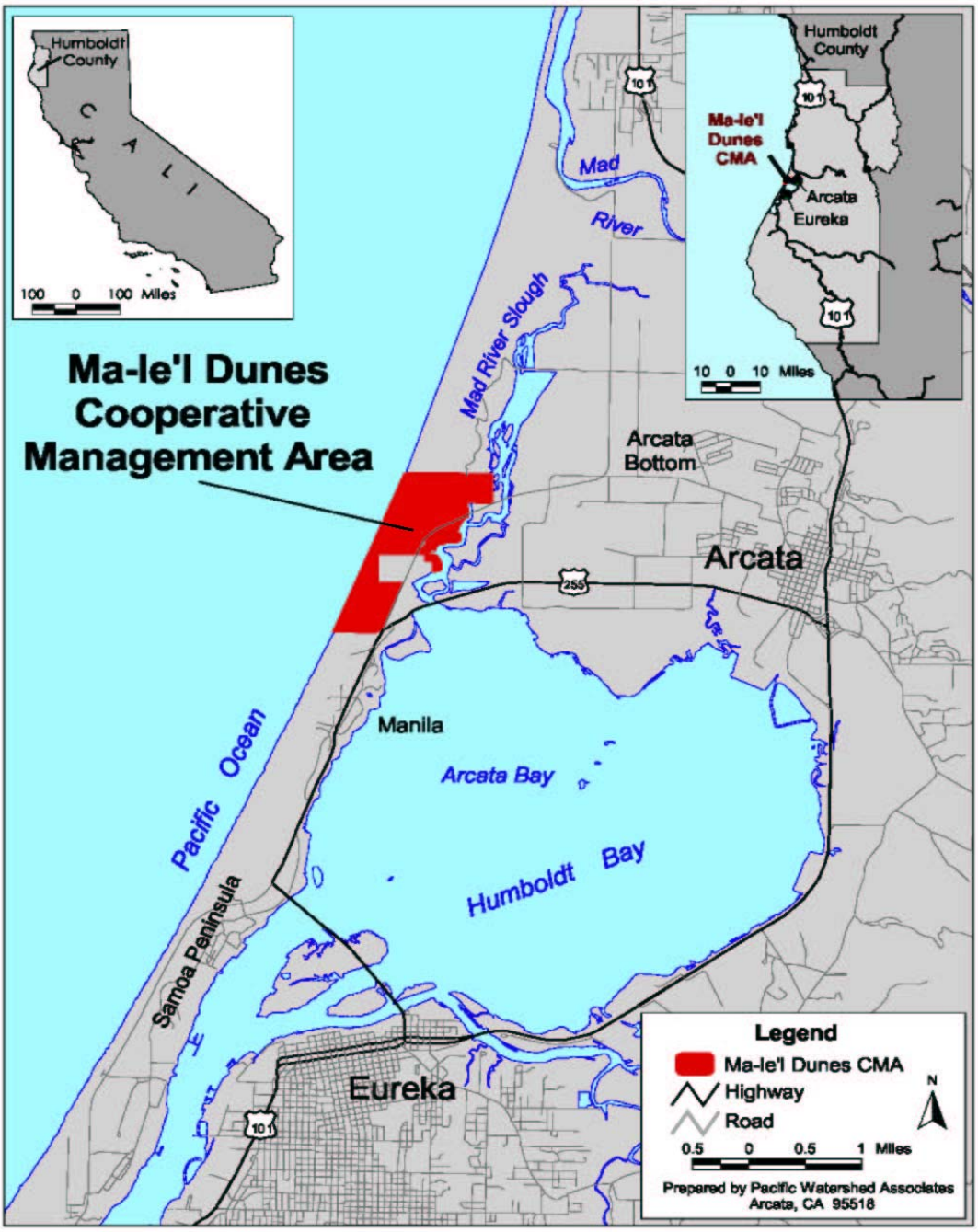

Figure 1. Location Map

1.2 Background and Agency Involvement

From 1992 to 1994, much of what is now known as the Ma-le'l Dunes CMA was managed for public use. This area occupied 385 acres and was known as the Mad River Slough and Dunes Cooperative Management Area. It was managed cooperatively among the landowners at the time: BLM, The Nature Conservancy, and Louisiana Pacific (LP). The area consisted of three properties, which were known as the Fernstrom-Root parcel of the Lanphere-Christenson Dunes Preserve, the 160-acre LP parcel, and the 112-acre Manila Dunes Area of Critical Concern. The area was closed to public use in 1994 when the Humboldt Buggy and ATV Association (a.k.a Buggy Club) purchased from LP the 42-acre Khoaghali parcel and the 160 LP parcels (later known as the Buggy Club parcels), thereby terminating the Cooperative Management Agreement (Figure 2- Ma-le'l Dunes CMA map).

In 2003, the SCC funded the acquisition by the Center for Natural Lands Management (CNLM) of the two Buggy Club parcels for public access, restoration and open space protection.

In July of 2004, the CNLM transferred the 42-acre Khoaghali parcel to the BLM, which began managing the property in conjunction with the adjacent 112-acre Manila Dunes Area of Critical Concern and consistent with the Arcata Resource Management Plan. These two properties combined to form the 154 acres area known as Ma-le'l South. Collectively, the 154 acres managed by BLM are known throughout the Plan as Ma-le'l South. Following the completion of an Environmental Assessment for Ma-le-l South in July 2005, BLM installed public access improvements at during the winter and spring 2005, and the area was opened for public access in July 2005.

In August 2005, CNLM transferred title to the 160-acre former Buggy Club parcel, including a 1-mile length of access roadway, to the USFWS, which began managing the properties in conjunction with the adjacent 113-acre Fernstrom-Root property (formerly part of the Lanphere Dunes Unit of the Humboldt Bay National Wildlife Refuge Complex). Collectively, the two USFWS properties comprise 290 acres and are managed as the Ma-le'l Dunes Unit of the USFWS Humboldt Bay National Wildlife Refuge Complex. The properties managed by the USFWS are known as Ma-le'l North.

Figure 2. Ma-le'l Dunes Cooperative Management Area (CMA) and Properties

1.3 Scope and Purpose for the Proposed Action

The BLM and USFWS have similar goals for the properties located within the Ma-le'l Dunes CMA. These goals are to protect the natural and cultural resources of the subject area and provide public access for recreation, education, and research activities. These goals are consistent with the goals of the SCC, which are to "protect, restore and enhance coastal resources and to provide access to the shore". The purpose of the Ma-le'l Dunes CMA Public Access Plan is to propose actions that will accommodate appropriate, orderly, and open public access throughout the 444-acre Ma-le'l Dunes CMA for a range of recreational uses.

Ma-le'l South is currently open for public access and recreational uses. However, public access improvements were approved only on an interim basis (USDI-BLM, 2004a, USDI-BLM 2004b). Access to Ma-le'l South is currently limited due to the lack of trails, water for equestrian use, and bicycle racks. Additionally, pedestrian access from the Ma-le'l South Parking area to the existing forest loop poses potential pedestrian-vehicular conflict because it directs the public along the access road in a way that encourages people to park along the access road or at the Pacific, Gas, and Electric power/tower trail head, which is inadequate in size. At caretaker trailer pad along the access road has power, telephone, and water connections, but it is overgrown and unoccupied.

Ma-le'l North currently lacks amenities to support appropriate public access. Specifically, the current design and structure of vehicular access road will not accommodate an increase in traffic, pedestrian-vehicle conflicts exist along the access road, vehicular circulation routes are undefined, parking areas are inadequate, ADA access is non-existent, and signing is completely lacking. Furthermore, beach access and forest trials are poorly defined, unmarked, eroding, or in disrepair, which encourages off trail use and the proliferation of casual trails. Designated sites for canoe and kayak landing along the slough are lacking, which encourages informal landing and trampling of salt marsh vegetation at several locations. Formal venues for trailside interpretation, scenic viewing, and resting are either potentially unsafe or completely lacking. On both Ma-le'l South and Ma-le'l North dilapidated structures, remnant fence posts, and wiring obscure the coastal landscape and in some cases may pose a public hazard (Figure 3- Existing Features)

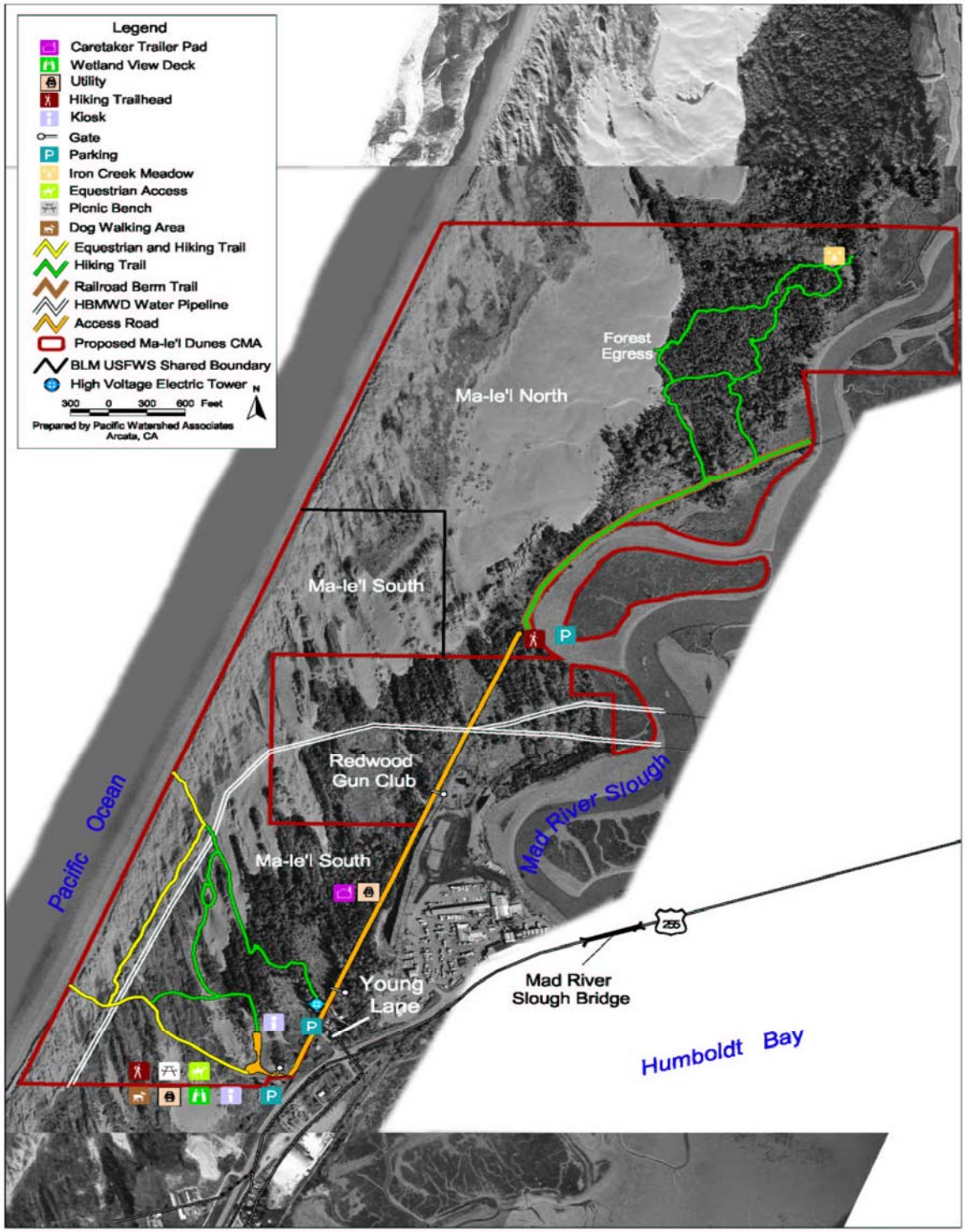

Figure 3. Existing Features of the Ma-le'l Dunes CMA

2.0 ALTERNATIVES INCLUDING PROPOSED ACTION

The Ma-le'l CMA area is located approximately one mile north of the unincorporated town of Manila and 3.5 miles west of the City of Arcata, in Humboldt County, California. It encompasses 444 acres of coastal dunes, forest, wetland, and estuarine ecosystems. The area currently has limited infrastructure including vault toilets, various signage and fencing, a gravel access road and parking areas, and various marked and unmarked trails.

The Ma-le'l CMA Plan team worked to develop alternatives that could achieve the Plan purpose and address the need while avoiding or minimizing environmental impacts. In addition, public comments from a public meeting which took place on August 4, 2004 regarding BLM's Ma-le'l Dunes Access Improvements Environmental Assessment process (USDI-BLM, 2004a), the USFWS Compatibility Determination and Pre-Acquisition Compatibility Determinations for the Proposed Ma-le'l Dunes Addition to the Humboldt Bay National Wildlife Refuge process (USUSFWS, 2004), and subsequent public comments were used to develop the following alternatives, which are described and considered throughout this document:

- Alternative A: The Proposed Plan—Range of Use and Minimum Improvements
- Alternative B: Multi-Use and Additional Improvements
- Alternative C: Protection and Restoration
- Alternative D: No-Action

This chapter describes the Plan alternatives and provides a summary comparison of each alternative. Criteria used to evaluate alternatives include biological resource impact, cultural resource impact, regulatory considerations, public accessibility, and cost.

2.1 Description of Plan Alternatives

2.1.1 Common Features of the Plan Alternatives

All of the Plan alternatives (except the No Action) have the following design features in common, which are presented in the categories of public use, access and circulation, access infrastructure, and access management:

Public Use

- Overnight camping would be prohibited, except as allowed at Ma-le'l South for special events, on a case-by-case basis that meet specific criteria.
- Fire would be allowed only in designated sites at Ma-le'l South.

- Motorized vehicle use outside of roadways and parking areas would not be allowed except in an emergency or for authorized maintenance, construction, restoration, or research purposes.
- Environmental restoration activities would continue.
- Educational field trip access would continue and increase.
- Firearms, crossbow/bow shooting, mineral sales, and livestock permits and leases would continue to be prohibited.

Access Infrastructure

- Dilapidated structures, remnant posts, and wire fencing would be removed.
- The boundary fence along the shared BLM/Ma-le'l South and USFWS/Ma-le'l North property line would be removed.
- The casual parking area adjacent to the Pacific, Gas, and Electric high voltage transmission line/tower would be closed.
- The gate located near the high voltage tower would be moved approximately 80 feet south, closer to the Young Lane-access road intersection.
- The existing wetland view deck would be re-constructed.

Access Management

The following cooperative agreements would be established:

- Agreement between BLM and USFWS for the management of the Ma-le'l Dunes CMA;
- Agreement between BLM, USFWS, and the Redwood Gun Club;
- Agreement between BLM, USFWS, and the Wiyot Tribe;
- Agreement between USFWS and Sierra Pacific; and
- Agreement between BLM, USFWS, and Friends of the Dunes.

2.1.2 Alternative A: The Proposed Plan - A Range of Public Use and Minimum Improvements

Alternative A is depicted in Figure 4, and in addition to the common features of the Plan alternatives would also include the following features:

Public Use

- Continued and increased opportunities for pedestrian use and associated activities would be allowed on 5,250 feet (1 mile) of designated trails, open sandy areas, and on the wave slope.
- Continued and increased opportunities for equestrian use would be allowed on 4,200 feet (0.8 miles) of designated trails and the wave slope on Ma-le'l South. Horses will not be allowed on Ma-le'l North.
- New pedestrian use would be allowed on 18,300 feet (3.5 miles) of newly designated and/or improved existing casual trails in the nearshore dunes and forest.
- Continued and increased opportunities for off-leash dog walking would be allowed on designated trails and open sands throughout Ma-le'l South and along the wave slope. Dogs would continue to be required to be leashed in the Ma-le'l South parking/picnic area. Dogs would not be allowed on Ma-le'l North.
- Group camping would be allowed on a case-by-case basis at the Ma-le'l South Special Event Area with a special recreation permit from BLM.
- Continued new and increased vegetation gathering for personal use from designated forest trails would be allowed by the general public from May to November in Ma-le'l South only, and otherwise by special permit on a case-by-case basis.
- Continued, new, and increased vegetative gathering for personal use by tribal members would be allowed in accordance with a memorandum of agreement with the Wiyot Tribe.
- Canoe and kayak launching and landing would be allowed in designated locations only.
- Access for people with disabilities would be provided at the Ma-le'l North and South parking and picnic areas and restrooms, and along approximately 2,800 feet (0.5 miles) of trail.

Access and Circulation

- Continued use of the improved Ma-le'l South day use/picnic area would be allowed.
- The existing gravel access road leading to the designated parking areas in both Ma-le'l North and Ma-le'l South would be improved and resurfaced. The road would remain "one lane" at 16 - 20 feet in width. Measures to improve road safety, drainage and durability would include: construction of "pull outs" in areas where no fill in wetlands or bank cuts are required, a turning radius at the Young Lane-access road intersection to accommodate vehicle turn-around, and gutter sections along roadway where needed.

- Pedestrians, bicyclists, and motorists would be notified, through signing, to be aware of each other and to use caution along the road.

Access Infrastructure

- New improvements to the Ma-le'l South day use picnic area would include the installation of a water spigot for equestrian use, and a bicycle rack.
- A 1,000-foot pedestrian safety corridor along the access road would be installed.
- The existing caretaker trailer pad and surrounding area would be improved. This would entail re-grading of the pad area, placement of base gravel, and vegetation clearing.
- The Ma-le'l North parking/day use picnic area would be enlarged and re-oriented to accommodate increased use, and would be re-surfaced with crushed gravel. It would also be upgraded to include: Ten motorized vehicle spaces and bus parking with one ADA vehicle space, with expansion of the parking area for nine additional motorized vehicle spaces.
- A kayak and canoe ramp measuring approximately 8 feet wide and 35 feet long would be installed at the Ma-le’l North parking/day use picnic area.
- A bicycle rack, information kiosk, picnic tables, trash and recycling receptacles, and an ADA accessible vault toilet would be installed at the Ma-le’l North parking/day use picnic area.
- 2,800 ft. (0.5 miles) of ADA compatible surfacing would be installed along the railroad berm trail. Trailhead steps, cable steps, and wooden steps and rail would be installed at various locations along trail ways.
- Casual trails though out the project area would be taken out of use and re-vegetated.
- 7,000 feet (1.3 miles) of new beach access trails and 11,300 feet (2.1 miles) of new forest trail would be delineated and marked with trail markers.
- A 15-foot long footbridge would be installed over a seasonal wetland area along a beach access trail.
- An 8-foot by 10-foot dune view deck would be constructed.
- Eight benches along the railroad berm trail would be installed.
- A coordinated signing program would be designed and implemented to include kiosks and the following sign types: entry, information, and safety, boundary, regulatory, trail marker and direction, interpretive, and temporary.

Access Management

A full time onsite caretaker position and protocols regarding vehicle control, law enforcement, and security would be established.

2.1.3 Alternative B: Multi-Use throughout The Plan area and Additional Improvements

Alternative B would have the common features of the Plan alternatives and be similar to Alternative A in allowing public use throughout the Ma-le'l Dunes CMA, but would also provide the following:

Public Use

- Increased opportunities for off-leash dog walking would be allowed at Ma-le'l North (in addition to Ma-le'l South).
- Equestrian use would also be allowed on the northern portion of the proposed Latkak trail.
- Bicycling riding would be allowed throughout the Ma-le'l Dunes CMA.
- Off-trail pedestrian use would be allowed at Ma-le'l South.
- Off-trail vegetative gathering would be allowed at Ma-le'l South.

Access Infrastructure

- A pedestrian trail connecting the Ma-le'l South and Ma-le'l North properties through the nearshore dunes would be delineated and marked.
- The access road and parking areas (Ma-le'l South and Ma-le'l North) would be paved with asphalt.

2.1.4 Alternative C: Protection and Restoration

Alternative C would have the common features of the Plan Alternatives but would limit public use throughout the entire Ma-le'l Dunes CMA to pedestrian use only with permit and via docent-led tours and restoration workdays. Specifically, the proposed actions of Alternative C would include the following:

Public Use

- The day use/picnic area located at Ma-le'l South and trails currently designated as beach hiking trails at Ma-le'l South would continue to be open to the public for pedestrian use. Forest hiking trails and beach trails currently used for equestrians and dog walking at Ma-le'l South would be closed for these uses and would be only available for pedestrian use by permit and via docent-led tours and field trips. Ma-le'l North would only be open for docent-led pedestrian use, tours, and field trips.

- The gates to Ma-le'l North would be locked at all times, and accessible only by key for authorized activities (e.g., guided walks, restoration activities, and gathering by the Wiyot).

Access Infrastructure

- A maintenance plan for the access road would be prepared and implemented but the road would not improved.

A coordinated signing program limited to the provision of an entry, boundary/no trespassing, and regulatory signage would be designed and implemented.

2.1.5 Alternative D: No Action

In the No Action Alternative the current situation as described in Section 1.3 Scope and Purpose for the Proposed Action would continue. Specifically, improvements and management at Ma-le'l South would continue and pedestrian trails and beach access through the nearshore dunes would not be extended. Access to Ma-le'l North would continue to be limited to monthly walks by special permit and restoration workdays. In addition, pedestrian trails and beach access throughout the nearshore dunes of Ma-le'l North (where biological species of concern and cultural resources are present) would not be delineated or marked. Parking at the Pacific, Gas, & Electric power tower trail would continue. The access road to Ma-le'l North and associated parking lot would not be improved and signage would not be installed. Trails throughout the forest and to beach access points would remain unmarked and unsigned.

2.1.6 Alternative Management Actions Considered but Dropped from Further Analysis

Off- trail pedestrian use at Ma-le'l South, on-leash dog walking at Ma-le-'l North, biking on the Ma-le'l North railroad berm trail, forest trails and the overnight camping at the Ma-le'l South and Ma-le'l North parking area are considered as part of the development of alternatives. However, these management actions and/or infrastructure to support them were considered infeasible because the anticipated adverse impacts could not be mitigated adequately. Also, they did not meet the goals of the Access Plan to provide public access with minimal impact.

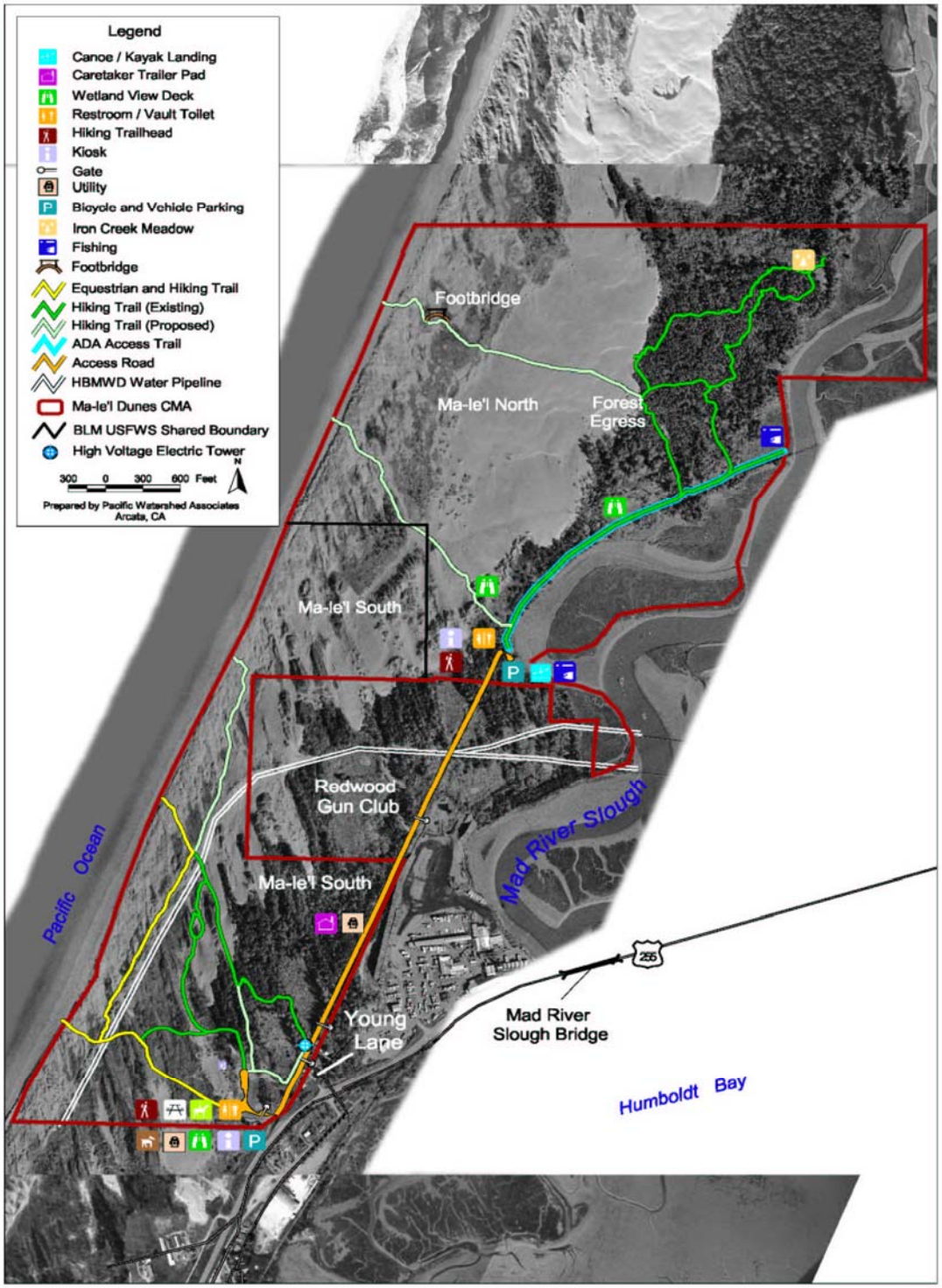

Figure 4. Alternative A: The Proposed Plan

2.2 Comparison of Alternatives

The *main* differences between the Plan alternatives are summarized in Table 2.1. Development of the Proposed Plan (Alternative A) was done through a review process and by working with the SCC, BLM and USFWS. Early in the process, these agencies determined that the goals of the CMA should be to provide open public access (including practicable Americans with Disability Act accessibility) for recreational, education and research activities while protecting the natural and cultural resources of the area. The challenge was to develop a plan that would accommodate a range of recreational opportunities with the minimal facility improvements to minimize, to the practicable extent, any adverse impacts to the natural and cultural resources of the area and to manage costs. This had to be done in the context of meeting the varied policies of the participating agencies. In addition, funds for implementation of the Plan were known to be limited and so the cost of infrastructure was considered.

Alternative A: Proposed Plan

The Proposed Plan (Alternative A) describes new and continued operation of recreational land use allocations within the Ma-le'l Dunes CMA. It also proposes the new installation, upgrade, and/or continued operation of roads, day use areas, including parking areas and public restrooms, and designated coastal access trails and trail amenities, including informational and interpretive signing, two view decks, a footbridge, and a canoe and kayak landing and launching ramp.

In Alternative A the existing gravel access road leading to the designated parking areas in both Ma-le'l North and Ma-le'l South would be resurfaced. Continued and increased pedestrian use and associated activities new beach access trails and forest trail would be delineated. Casual trails though out the project area would be taken out of use and re-vegetated. A coordinated signing program would be implemented. Seasonal, personal vegetative gathering from designated forest trails and Tribal vegetative gathering would be allowed in Ma-le'l South; only Tribal gathering would be allowed in Ma-le'l North. A full time onsite caretaker position for security would be established.

In Ma-le'l South the day use/picnic area would be upgraded for access for people with disabilities. A water spigot for equestrian use, and a bicycle rack would be installed. There would be increased opportunities for equestrian and off-leash dog walking on designated trails and open sands.

In Ma-le'l North, new pedestrian use would be allowed on 3.5 miles of newly designated and/or improved existing trails. Trailhead steps, cable steps, and wooden steps and rail would be installed at various locations along trail ways. An 8-foot by 10-foot dune view deck would be constructed as well as the installation of eight benches along the railroad berm trail. The Ma-le'l North parking/day use picnic area would be opened, enlarged and re-oriented to accommodate increased use, and would be re-surfaced with crushed gravel. It would also be upgraded to include: Ten motorized vehicle spaces and bus parking, with expansion of the parking area for nine additional motorized vehicle spaces. A bicycle rack, information kiosk, picnic tables, trash and recycling receptacles, vault toilet and kayak and canoe ramp would be installed at the Ma-le'l North parking/day use picnic area. Access for people with disabilities would be provided for in the day use/picnic area

restroom, and along approximately 0.5 miles of ADA compatible surfaced trail along the old railroad berm. Dogs would not be allowed on Ma-le'l North. The potential impacts and mitigations of the proposed Plan are discussed further in Section 3 of this report.

Alternative B: Multi-Use throughout The Plan area and Additional Improvements

The Multi-Use and Additional Improvements Alternative (Alternative B) was developed as a plan that would provide for more public access and broader range of uses over the entire plan area. This alternative includes all of the infrastructure and uses proposed in Alternative A. However, it would have more infrastructure and allow for a more and varied use of the area. This would include the paving of the access road and parking areas and the installation of additional trials to facilitate expanded use. Uses such as off-leash dog walking, horseback riding, and bicycling riding would also be expanded and allowed throughout the Ma-le'l Dunes CMA. Off-trail pedestrian use and off trail vegetative gathering would be allowed at Ma-le'l South.

Compared to the Proposed Plan, Alternative B is more "developed," and preliminary analysis determined that some physical impacts such as aesthetics, noise, air quality, hazards, cultural and land use would not be significantly different. However, some impacts to resources such as to biological, traffic and water quality could be significantly greater than in the Proposed Plan. Potential significant impacts that would increase under Alternative B include the disturbance of wildlife and sensitive habitat areas from expanded foot traffic, equestrian use and off-leash dog walking. There could also be a significant increase in impervious areas by the paving of the access road and parking lots. This could increase runoff into ditches, vegetated areas, adjacent wetlands increasing the potential impacts from hydrocarbons and metals and other stormwater related pollutants that would drain directly into these areas that are now sequestered in the gravel surfacing. In addition, there could be an increased danger to pedestrians and bicyclists by paving the access road from the likely increase of speed of vehicles. Addressing this issue could lead to the need for significantly widening the road prism and possibly filling adjacent wetland areas. While it is possible that while most of these impacts could be mitigated to a less than significant level when considered in aggregate the impacts are considerably more than what would be expected from implementation of the proposed Plan.

Alternative C: Protection and Restoration

The Protection and Restoration Alternative (Alternative C) would limit public use at Ma-le'l South to pedestrian use of beach trails only and, on Ma-le'l North, to docent-led hiking and/or restoration workdays, and for approved Tribal gathering throughout the entire Ma-le'l Dunes CMA. This limited public access would ensure that visitors to the CMA would avoid endangered and threatened species populations and sensitive habitat areas. In addition, there would be continued management of the CMA and habitat restoration.

Although the implementation of Alternative C would not generate any significant change in most of the physical characteristics of the site or the management of surrounding areas, Alternative C would benefit sensitive populations endangered, threatened, and sensitive species and habitats more than Alternatives A, B and D. However, unlike Alternatives A

and B, this alternative would isolate the cultural properties and likely result in cumulative adverse impacts to cultural resources as looters, vandals, and casual collectors would be able to conduct their nefarious activities in the absence of a watchful public.

Alternative D: No Action

In the No Action Alternative (Alternative D) the current situation as described in Section 1.3 Scope and Purpose for the Proposed Action would continue. Specifically, interim improvements and management at Ma-le'l South would continue and pedestrian trails and beach access through the nearshore dunes would not be extended. Access to Ma-le'l North would continue to be limited to monthly walks by special permit and restoration workdays. No ADA access would be provided. Trails throughout the forest and to beach access points would remain unmarked, unsigned. Casual trails throughout the project area would not be removed. The dilapidated condition of trails, steps and rail, the wetland view deck and remnant fences posts and wiring would remain. Unlike Alternatives B and C, Alternative D is discussed throughout in Chapter 3. Environmental Consequences, as it is the existing condition of the Plan area.

Under Alternative D the current conditions described above would continue. Although not accessible to visitors, the dilapidated structures, the condition of the stairs and viewing decks, random wire fencing and posts, throughout the area would not be removed or improved and would impact the visual quality of the area and potentially the safety of visitors. Lack of signage near the Redwood Gun Club property would continue to create safety hazards for visitors.

Under Alternative D, biological resources located within Ma-le'l North, including threatened, endangered and special status plant species would not be afforded the same protection because the signing program, fencing, decommissioning of casual, monitoring of compliance through caretaker presence proposed under Alternative A would not be implemented. Biological resources on located within Ma-le'l South would also be less protected because of the lack of caretaker presence. Illegal entry to Ma-le'l North continue to pose a potentially significant threat to biological resources (as well as cultural resources) because illegal visitors would continue to use a vast next work of casual trails throughout the Plan area and encourage further "trail blazing" throughout the site by visitors. This is an unmitigated potentially significant impact.

Alternative D would also cause on-going impacts to native vegetation, breeding birds, herons and/or egrets, raptors and land birds due to routine vegetation clearing required to maintain an open corridor for open public access in Ma-le'l South, and permit and docent lead entry in to Ma-le'l North.

The areas of erosion identified along the railroad berm would not be addressed and could have the potential to impact water quality through sedimentation and could lead to loss of this trail over time. Causal trails could also have the potential to create new areas of erosion due to improper drainage. Symbolic rope fencing would continue to be used to discourage boat landing. The effectiveness of symbolic fencing to protect areas that have been trampled by boat landing is unknown. However, it is expected that such fencing would require regular maintenance and/or replacement.

Due to the restriction of access to the Ma-le'l North area Alternative D would have less impact to biological resources than Alternatives A and B. However, continued deterioration of existing infrastructure could cause substantial hazard and erosion impacts. These issues would be address by the implementation of Alternative A, B, and C. The SCC, BLM, and USFWS also determined that some reasonable ADA access be provided as part of a public access plan at the Ma-le'l Dunes CMA. Through the planning process it was determined this could only reasonably be achieved in the Ma-le'l North along the old railroad berm. This would require vehicle access to the Ma-le'l North parking area. Like Alternative C, Alternative D does not provide for adequate ADA access.

Table 1. Comparison of Alternatives

	Alternative A: The Proposed Plan	Alternative B: Multi-Use Throughout	Alternative C: Protection and Restoration	Alternative D: No Action
Public Use	• Common Features of the Plan Alternatives for Public Use[1]. • Continued and increased pedestrian use of 1 mile of trail and new pedestrian use of 3.5 miles of trail. • Continued and increased equestrian use on 0.8 miles of trail and the waveslope. • Continued and increased off leash dog walking in Ma-le'l South on designated trails and the waveslope • Canoe and kayak accessibility via launching at one designated location. • ADA on 0.5 miles of trail and in the Ma-le'l South and Ma-le'l North parking areas. • Bicycle riding along the access road. • Continued and increased use of the Ma-le'l South day use/picnic area. • Continued new and increased vegetative gathering for personal use from designated forest trails from May to November in Ma-le'l South only, and otherwise by special permit on a case-by-case basis.	• Common Features of the Plan Alternatives for Public Use[1]. • Pedestrian trails would consist of 3.8 miles of new trails, 1 mile of preexisting trails, and off-trail use in Ma-le'l South. • Off leash dog walking in Ma-le'l North • Equestrian use on portions of the nearshore dunes/coastal (Latkak) trail • Bicycle riding throughout the Ma-le'l Dunes CMA • Canoe and kayak accessibility via launching in designated locations. • Increased use of the Ma-le'l South day use/picnic area. • Off-trail vegetative gathering would be allowed at Ma-le'l South.	• Common Features of the Plan Alternatives for Public Use[1]. • The day use/picnic area located at Ma-le'l South and trails currently designated as beach hiking trails at Ma-le'l South would continue to be open to the public for pedestrian use. • Ma-le'l North would only be open for docent-led pedestrian use, tours and field trips. • There would be no equestrian use, bicycle riding, or dog walking throughout the CMA.	• Preexisting uses at Ma-le'l South would continue. No new uses at Ma-le'l North would take place
Access and Circulation	• Improvements to the gravel access road including "pull outs," a turning radius at the Young Lane-access road intersection, and gutter sections along roadway. • Signage along the access road that would advise pedestrians, bicyclists, and motorists to use caution along the road.	• Increased signage • Improvements to the access road and parking areas including paving the areas with asphalt.	• Improvements to the access road would not be made.	• Improvements to the access road would not be made. • Ma-le'l North would not be open for public access without permit or docent • A full time caretaker would be onsite. • Vehicle control, law

[1] See Section 2.1.1 Common Features of the Plan Alternatives

				enforcement, and security would be established.
	Alternative A: The Proposed Plan	**Alternative B: Multi-Use Throughout**	**Alternative C: Protection and Restoration**	**Alternative D: No Action**
Access Infrastructure	• Common Features of the Plan Alternatives for Access Infrastructure. • Installation of a bicycle rack and a water spigot for equestrian use at the Ma-le'l South day use area. • Ma-le'l North parking area would be • improved with re-surfacing with crushed gravel, expansion for nine additional vehicles, and ADA vehicle spots. • Amenities at the Ma-le'l North would include bicycle rack, information kiosks, picnic table, waste management receptacles, and vault toilets. • 1,000 ft safety corridor along access road. • Trailer pad would be improved • Canoe and kayak ramp at Ma-le'l North parking area • Trail upgrades including trailhead steps, cable steps, and wooden steps. • Revegatation of casual trails • Footbridge over wetland • Dune view deck and eight benches • Signage for safety, information, and regulatory information	• Common Features of the Plan Alternatives for Access Infrastructure. • A pedestrian trail connecting Ma-le'l South and Ma-le'l North along the nearshore dunes.	• Common Features of the Plan Alternatives for Access Infrastructure. • A management plan for the access road would be prepared and implemented. • Signage would be installed to tell the provisions of entry and the regulations. • A management plan for the access road would be prepared and implemented.	• No additional access infrastructure would be installed other than the preexisting amenities.
Access Management	• A full time caretaker would be onsite. • Vehicle control, law enforcement, and security would be established. • A management plan for the access road would be prepared and implemented.	• A full time caretaker would be onsite. • Vehicle control, law enforcement, and security would be established. • A management plan for the access road would be prepared and implemented.	• No on-site caretaker. Vehicle control, law enforcement, and security would not be established. • A management plan for the access road would be prepared and implemented.	• No on-site caretaker. Vehicle control, law enforcement, and security would not be established.

2.3 Permits and Approvals Needed

Table 2 lists the required permits, reviews, and approvals required for the Plan approval and construction.

Table 2. Permits and Approvals Needed for Proposed Project

Agency	Permit/Approval
United States Fish and Wildlife Service/ National Marine Fisheries Service	Section 7 Consultation for Biological Assessment
National Marine Fisheries Service	Section 305 Consultation concurrent with Section 7
United States Fish and Wildlife Service	Federal Migratory Bird Treaty Act consultation
United States Army Corps of Engineers	Nationwide 36 permit/concurrence (for boat ramps)
California Department of Fish and Game	Section 2080 consultation for species that are also federally protected
California Department of Fish and Game	Fish & Game Code Sections 3503 and 3503.5 Bird Nest Protection such as osprey consultation
California Department of Fish and Game	Fish & Game Code Sections 3511, 4700, 5050 and 5515 fully protected animals consultation
Humboldt Bay Harbor, Recreation and Conservation District	Encroachment Permit for projects in tidelands below Mean High Water Elevations
California Coastal Commission	Section 307 permit for projects located within the Coastal Zone
North Coast Regional Water Quality Control Board	Section 401 Water Quality Certification
State Water Resources Board	General Construction Water Discharge Requirements for construction activities covering over one acre.
State and Tribal Historic Preservation Office	Section 106 consultation for record search and Field Surveys

3.0 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

In this section, the affected (existing) environment is described for each identified relevant topic. Impacts associated with the alternatives are then described, with avoidance, minimization, and/or mitigation measures outlined when feasible. Permits that would potentially be required for actions associated with the proposed alternative impacts follow.

3.1 Aesthetics

This section describes the current aesthetics of the Ma-le'l Dunes CMA properties.

Regulatory Setting

The National Environmental Policy Act of 1969 as amended (NEPA) establishes that the federal government use all practicable means to ensure all Americans safe, healthy, productive, and aesthetically and culturally pleasing surroundings [452. U.S.C. 4331 (b)(2)].

The California Environmental Quality Act (CEQA) establishes, that it is the policy of the state to take all action necessary to provide the people of the state with… enjoyment of aesthetic, natural, scenic, and historic environmental qualities." [CA Public Resource Code Section 21001(b)]

Likewise, the Humboldt County General Plan and Humboldt County Local Coastal Program, Humboldt Bay Area Plan have adopted California Coastal Act policies to protect visual qualities of the coastal areas as a resource of public importance [Section 30251 of Humboldt County General Plan and Public Resource Code Section 30000 of the CA Coastal Act].

In addition, the HBHRCD 2005 Humboldt Bay Management Plan also contains policies protecting aesthetic values of Humboldt Bay. These policies require that the existing views of the Humboldt Bay be protected, and that when feasible enhanced.

Affected Environment

The Ma-le'l Dunes CMA is located on the North Spit of Humboldt Bay, (also known as the Samoa Peninsula), in Humboldt County, California. The Ma-le'l Dunes CMA comprises approximately 444 acres with approximately 1.5 miles coastline.

The dominant visual characteristics of the Plan Area are natural habit types consisting of a variety of coastal dunes, wetlands, forests, and estuarine ecosystem communities. Additionally, the Plan area is bordered by two bodies of water: the Pacific Ocean and the Mad River Slough (a slough of Humboldt Bay).

The secondary visual characteristics of the Plan area include a variety of recreational amenities, hardscape landscaping, caretaker's area and access roads. The secondary visual characteristics of the Plan area are discussed below:

- 3 miles of foot trails traversing the Ma-le'l Dunes CMA
- The gravel access road (also referred to as the Ma-le'l Road in the Plan)
- 2 formal gravel parking areas and one casual gravel parking area that provides access to Ma-le'l South and Ma-le'l North
- Hardscape landscaping including picnic benches, signage, information kiosks, trash receptacles, and trail markers
- Portable toilets and water spigots
- Gates limiting access to certain area of the CMA
- Fencing that delineates current and historical property lines and border several residences
- Several residences located along the access road

Environmental Consequences

Alternative A: Proposed Plan

The proposed Plan would not cause any detrimental affects to the visual characteristics or visual quality of the Plan area. Additionally, the improvements proposed under the Plan would increase the visual quality of the Ma-le'l Dunes CMA by improving the existing infrastructure and creating additional access to Ma-le'l North, installing new trails, and viewing decks. Construction activities would cause a temporary adverse affect to visual quality; however, due to the short-term nature of the activities this impact would be less than significant.

Adjacent to the Plan area, State Highway 255 is not currently listed as an official state scenic highway; therefore, the Plan would not cause any impacts to scenic resources along a scenic highway.

The Plan would not involve installation of any new lighting systems and would not cause any adverse affects associated with new sources of glare or substantial light.

Alternative B: Multi-use Throughout and Additional Improvements

The potential impacts to aesthetics would be similar as described in Alternative A. Alternative B would pave the parking areas to Ma-le'l South and Ma-le'l North. Paving the parking areas would change the visual characteristics of the access and parking areas to Ma-le'l Dunes CMA; however, this change would be less than significant.

Alternative C: Protection and Restoration

Alternative C would have no impacts to the existing visual characteristics or visual quality of the Ma-le'l CMA. Additionally, Alternative C would ensure the protection of the existing visual characteristics of the Ma-le'l Dunes CMA due to the fact that Alternative C would not alter the visual characteristics of the Plan area.

Alternative D: No Action

The No Action alternative would not change the visual characteristics of the Plan area and would not cause any detrimental effects the aesthetic quality of the Plan area. The visual characteristics of the Plan area would not be changed because the existing visual features would not be altered in any way. However, the visual quality of the Plan area would not be improved under the No Action alternative because the dilapidated structures would not be removed, would continue to dilapidate, and new amenities and infrastructure would not be installed.

3.2 Agricultural Resources

This section describes the current agricultural resources of the Ma-le'l Dunes CMA properties.

Regulatory Setting

Agricultural resources are protected by many state, federal, and local laws. These state and federal laws include:

- NEPA and the Farmland Protection Policy Act (FPPA, USC 4201-4209, and its regulations, 7 CFR Ch. VI Part 658)
- CEQA Section 15206
- California Land Conservation Act of 1965 (Govt. Code Section 51200, Title 5, Ch. 7) is California's principal policy for the preservation of agricultural and open-space land
- Humboldt Bay Area Plan, Local Coastal Program (Policies 30241 and 30242)

Affected Environment

The Ma-le'l Dunes CMA is designated and zoned Natural Resources (NR) by the County of Humboldt. Additionally, it is zoned coastal, and is regulated by the California Coastal Act and Humboldt Bay Area Local Coastal Plan. The Ma-l'el CMA does not contain any property zoned Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. There are currently agriculturally zoned properties northeast of the Plan area used for grazing.

Environmental Consequences

Alternative A: Proposed Plan

The Ma-le'l Dunes CMA is not zoned agricultural and would not conflict with zoning for agricultural uses or a Williamson Act contract. In addition, the projects contained in the access Plan are not anticipated to result in conversions of adjacent zoned agricultural lands to non-agricultural uses.

Alternative B: Multi-use Throughout and Additional Improvements

The potential impacts to agricultural resources would be the same as described in Alternative A.

Alternative C: Protection and Restoration

The potential impacts to agricultural resources would be the same as described as Alternative A.

Alternative D: No Action

The potential impacts to agricultural resources would be the same as described as Alternative A.

3.3 Air Quality

This section describes the current agricultural resources of the Ma-le'l Dunes CMA properties.

Regulatory Setting

The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its counterpart in the California is the California Clean Air Act of 1988. The North Coast Unified Air Quality Management District (NCUAQMD) monitors the air quality in Humboldt County. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for carbon monoxide(CO), nitrogen dioxide (NO_2), ozone (O_3), and particulate matter that is 10 microns in diameter or smaller (PM_{10}).

Affected Environment

The project area is located within the North Coast Air Basin (Basin), which is contiguous with the counties of Del Norte, Trinity, Humboldt, Mendocino, and northern Sonoma.

The maritime climate of coastal Humboldt County is characterized by high relative humidity the entire year, and is maintained throughout the dry season, May through

September, by fog and clouds. The annual average precipitation from 1971 to 2000 at the Eureka, CA weather station was 38.32 inches. Approximately 90% of annual precipitation falls during the rainy season, which begins in October and continues through April. Temperatures on the coast remain mild and moderate throughout the year. The mean annual temperature for 1971 to 2000 was 52.9°F, with a maximum and minimum annual temperature of 59.3°F and 46.4°F respectively (NOAA, 1995).

The Basin air quality standards have been monitored by the NCUAQMD since approximately 1956. The NCUAQMD has developed classifications attainment levels for all criteria air pollutants except for PM_{10} levels (particulate matter with an aerodynamic diameter of 10 microns or less). However, adjacent rural air quality management districts have developed attainment levels for PM_{10} emission at a range of 80~130 lbs/day.

The Basin air quality meets the National Clean Air Act, California Clean Air Act, and NCQAQMD attainment levels for all criteria air pollutants. However, the North Coast Air Quality Basin has been known to exceed California air quality standards for PM_{10} during winter months when woodstove emissions add to the always present auto emissions and sea salts.

Environmental Consequences

Alternative A: Proposed Plan

Generation of particulate matter and emissions from construction vehicles would be minor because construction-related activities would be temporary and not extensive. Additionally, there are no sensitive receptors to air pollution in the vicinity of the project site and the proposed construction activities are not anticipated to generate any objectionable odors.

There would be no long-term air quality impacts associated with the proposed Ma'l-el CMA Plan.

Alternative B: Multi-use Throughout and Additional Improvements

Alternative B would increase the construction-related emissions due to the paving of the access road and parking area. Increased construction would potentially increase short-term construction related emissions. However, this increase would be a less than significant amount.

Alternative C: Protection and Restoration

The potential impacts to air quality would be the same as described in Alternative A.

Alternative D: No Action

The No Action alternative would have no long term or short-term impacts to air quality. The No Action alternative would not conduct any construction activities that would release PM_{10} (particulate matter) or construction vehicular emissions.

3.4 Biological Resources

This section describes the existing biological resources of the Ma-le'l Dunes CMA, presents the potential impacts to these resources from implementation of the proposed the Plan, and identifies measures warranted to mitigate potential adverse impacts.

The descriptions in this chapter are based on an independent evaluation of the habitats within the CMA conducted by Mad River Biologists, review of the most current versions of the California Natural Diversity Data Base (2006), review of existing biological and environmental assessments prepared for portions of the CMA by the Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (USFWS) and informal consultation with CMA resource managers.

Regulatory Setting

Federal Endangered Species Act

The primary purpose of the Federal Endangered Species Act (ESA) of 1973, as amended, is to protect and conserve endangered and threatened species and the ecosystems upon which they depend. An endangered species is one that is declared by a state or federal agency to be in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is declared by a state or federal agency to be likely to become endangered within the near future.

California Endangered Species Act

The California Endangered Species Act (CESA), enacted in 1984, and patterned after the federal ESA, is administered by the California Department of Fish and Game (CDFG). The CESA requires state and lead agencies preparing California Environmental Quality Act (CEQA) documents to consult with CDFG regarding potential impacts on state listed species. Consultation is intended to ensure that actions authorized, funded, or carried out by the lead agency are not likely to jeopardize the continued existence of listed threatened or endangered species, or destroy or adversely modify "essential habitat" (i.e., habitat necessary to the continued existence of the species. If a project may affect species listed jointly under the ESA and CESA, CDFG must participate in ESA Section 7 consultation to the maximum extent possible. CESA allows for take incidental to otherwise lawful development projects. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project-caused losses of listed species populations and their essential habitats. The Department may authorize, through permits and memoranda of understanding, the

take and possession of State-listed species for scientific, educational, and management purposes. The Habitat Conservation Planning Branch (HCPB) administers this permitting process. Permits are required for all individuals on both public and private lands.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. Migratory birds include geese, ducks, shorebirds, songbirds, wading birds, seabirds, and passerine birds (such as warblers, flycatchers, swallows, etc.).

California Fish and Game Code Sections 3503, 3503.5, and 3800

These sections of the Fish and Game Code prohibit the "take, possession, or destruction of birds, their nests or eggs." Disturbance that causes nest abandonment and/or loss of reproductive effort (killing or abandonment of eggs or young) is considered a "take." Such a take would violate the Migratory Bird Treaty Act.

California Fish and Game Code Section 1601

Pursuant to Fish and Game Code sections 1601-1603, the California Department of Fish and Game (CDFG) regulates activities that use materials from any streambed; or divert, obstruct, or change the natural flow or bed of any river, stream, or lake. Section 1601-1603 allow CDFG to review any proposed construction of a fish or game resource that might be substantially adversely affected by such construction. CDFG enters into a Streambed Alteration Agreement with a project applicant and can impose conditions on the agreement to prevent adverse impacts to fish and wildlife resources and ensure no net loss of wetlands. If mutual agreement between the CDFG and the affected agency is not reached, agreement will be reached through arbitration procedure to be completed prior to construction of the proposed project.

California Coastal Act Policies

The California Coastal Act policies within section 3.30 Natural Resources Protection Policies and Standards of the Humboldt County General Plan Volume II Humboldt Bay Area Plan of the Humboldt County Local Coastal Program. These policies provide for protection of environmentally sensitive habitat areas. Additionally, the Coastal Act provides for protection of biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms for the protection of human health. Where feasible these areas should be restored through means minimizing the adverse effects of waste water discharges and entrainment, control mg runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

U.S. Fish and Wildlife Service Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly

The Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly delineates reasonable actions that are believed to be required to recover and/or protect seven plants and one invertebrate animal from the coastal dunes of northern and central California, with the ultimate objective of delisting the species once recovery criteria are achieved. Species included in the recovery plan that are pertinent to the Ma-le'l Dunes CMA include Humboldt Bay wallflower and beach layia.

Western Snowy Plover Pacific Coast Population Draft Recovery Plan

The Western Snowy Plover Pacific Coast Population Draft Recovery Plan delineates reasonable actions that are believed to be required to recover and/or protect the Pacific coast breeding population of western snowy plover, which extends from Damon Point, Washington to Bahia Magdalena, Baja, California, Mexico. The primary objective of the recovery plan is to remove the Pacific coast western snowy plover population from the list of *Endangered and Threatened Wildlife and Plants* by: 1) achieving well-distributed increases in numbers and productivity of breeding adult birds and 2) providing for long-term protection of breeding and wintering plovers and their habitat.

Affected Environment

The Ma-le'l Dunes CMA features a unique assemblage of coastal dune, forest, and wetland communities that comprise a portion of the dune-slough ecosystem of the upper Samoa Peninsula, or North Spit. The North Spit is a relatively mature dune system that contains a diversity of landforms. Typically, the dune system begins above the beach with the foredune, a ridge of sand that forms parallel with the beach above the mean high tide. Behind the foredune is a series of longitudinal dune ridges and swales oriented parallel to the prevailing winds. Collectively, the foredune, dune ridges and swales are referred to as the nearshore dunes. East of the nearshore dunes is a deflation plain that grades into large parabolic moving dunes or sand sheets. Older dunes, located east of the moving dunes, consist of stabilized parabolas, ridges and depressions that support coniferous coastal forest on the uplands and deciduous freshwater swamp or marsh in the low lying wetlands. Estuarine wetlands associated with the Mad River Slough occupy the far eastern side of the CMA.

The major vegetation types found within the CMA are depicted in Figure 5, and summarized by representative acreage in Table 3: Vegetation data for Ma-le'l South and Ma-le'l North was provided by the BLM and the USFWS (respectively) for the creation of the habitat map. Descriptions of the various vegetation and habitat types, including a discussion of their associated plant and animal communities and their relative sensitivity and regulatory status are provided in the following section.

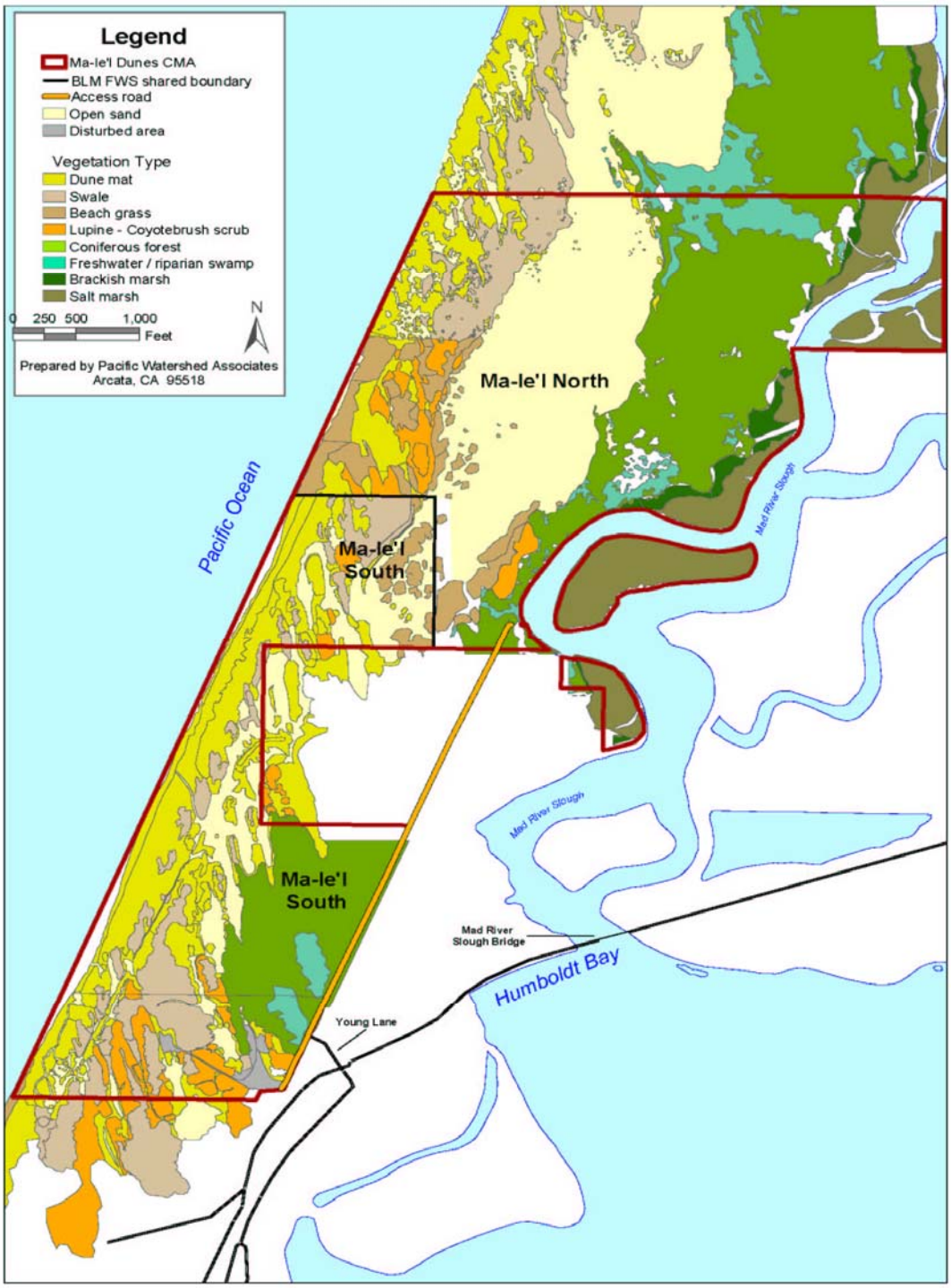

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Figure 5. Vegetation Types at the Ma-le'l Dunes CMA

Table 3. Summary of Vegetation and Habitat Types and Representative Acreage for Ma-le'l Dunes CMA (based on data from 2003-2005)

Vegetation Type	Approximate Area
Coniferous Forest	100 acres
Dune Mat	75 acres
European Beachgrass	25 acres
Lupine - Coyote Brush Scrub	10 acres
Open Sand	129 acres
Dune Swale	50 acres
Riparian/Freshwater Swamp	15 acres
Brackish Marsh	5 acres
Salt Marsh	35 acres

Coniferous Forest – Approximately 100 acres of coastal coniferous forest are found at the Ma-le'l Dunes CMA, occurring on upland stabilized dunes immediately inland from the active moving dunes that encroach upon them. Forested dunes such as these are unique among north coast coniferous forests and have been likened to biological islands due to their isolation and relative small size (USDI-BLM 2004a).

Coniferous forests within the CMA include the Beach Pine and Sitka Spruce vegetation series described by Sawyer and Keeler-Wolf (1995). Canopy cover within these two series varies from low to high. Trees are typically between 10 and 20 meters tall and the forest is structurally diverse (Pickart 1990). Dominant overstory species include beach pine (*Pinus contorta* ssp. *contorta*) and Sitka spruce (*Picea sitchensis*), however, Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), and madrone (*Arbutus menziesii*) may also be present. The canopy is typically open in younger-aged beach pine stands with a dense understory of evergreen huckleberry (*Vaccinium ovatum*), silk tassel (*Garrya elliptica*), salal (*Gaultheria shallon*), twinberry (*Lonicera involucrata*), red-flowering currant (*Ribes sanguineum*) and/or wax myrtle (*Myrica californica*). In mature forests, the tree canopy is more closed and there is a less developed shrub layer and stronger presence of low growing ground cover species such as bearberry (*Arctostaphylos uva-ursi)*, reindeer lichen (*Cladina pacifica*), and false lily-of-the-valley (*Maianthemum dilatatum*). Other common herbaceous associates include pearly everlasting (*Anaphalis margaritacea*), hawkweed (*Hieracium albiflorum*), beach goldenrod (*Solidago spathulata*), yerba buena (*Satureja douglasii*), vanilla grass (*Hierochloe occidentalis*), and hawkweed (*Hieracium albiflorum*).

Orchids are known to occur within the understory of the coniferous forests of the North Spit, including rattlesnake orchid (*Goodyera oblongifolia*) and rein orchids (*Piperia elegans* and *P. transversa*. Forested dunes such as these are also known to support a diverse and abundant flora of mosses, lichens, and fungi. Two rare maritime lichens of the genus *Bryoria* (*B. spiralifera* and *B. pseudocapillaris*) have been reported from similar habitats on the North Spit (Glavich 1999).

Forested dunes within the Ma-le'l Dunes CMA are bordered by a variety of highly productive habitats, including riparian/freshwater swamp, brackish marsh and salt marsh, all of which provide a prey base for a variety of amphibians, reptiles, birds and mammals that utilize the forest-wetland complex for cover, foraging and/or nesting habitat.

Given the relatively small and isolated nature of this habitat type within the CMA most species that occur here are those exhibiting comparatively small home ranges. Similarly, it probably functions as a biological island for many of the species it supports due, once again, to its size (exhibiting high ratio of edge to interior habitat) and isolation. Therefore immigration by individuals from outside of the habitat patch must occur to maintain inhabitance by some of the representative species, especially those with larger home ranges (Sterling 1990).

Amphibians likely to be resident in the coniferous forest are California slender salamander (*Batrachoseps attenuatus*), Ensatina salamander (*Ensatina eschscholtzii picta*), and clouded salamander (*Aneides ferreus*). Other amphibian and reptile species such as rough-skinned newt (*Taricha granulosa*) and northwestern salamander (*Ambystoma gracile*) may also use it for cover and foraging habitat. All of these species are terrestrial and require the type of moisture-rich ground cover generally associated with this habitat type.

Reptiles including northern red-legged frog (*Rana aurora aurora*), Pacific chorus frog (*Hyla regilla*) and California red-sided garter snake (*Thamnophis sirtalis*) are likely to occur in dune swales and probably utilize adjacent upland coniferous forest for cover and foraging habitat.

Representative mammalian species include terrestrial species such as Virginia opossum (*Didelphis virginiana*), insectivores (vagrant shrew (*Sorex vagrans*) and shrew mole (*Neurotrichus gibbsii*)), lagomorphs (brush rabbit (*Sylvilagus bachmani*) and black-tailed jackrabbit), rodents (deer mouse (*Peromyscus maniculatus*), western harvest mouse (*Reithrodontomys megalotis*), Pacific jumping mouse (*Zapus princeps*) and California vole (*Microtus californicus*), porcupine (*Erethizon dorsatum*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), western spotted skunk (*Spilogale gracilis*), striped skunk (*Mephitis mephitis*), feral cat (*Felis catus*), and bobcat (*Lynx rufus*). Flying mammals likely to occur as foragers include California myotis (*Myotis californicus*), Yuma myotis (*Myotis yumanensis*) and big brown bat (*Eptesicus fuscus*) while hoary bat (*Lasiurus cinereus*) and Mexican free-tailed bat (*Tadarida brasiliensis*) are possible but not likely. Special status mammals that utilize coniferous forest include white-footed vole, known to occur in the project vicinity (CNDDB 2006), and Sonoma tree vole (*Arborimus pomo*) which has a low potential for occurrence within the CMA.

Avian species expected to utilize this forest type are many of those associated with both

forest interior and edge habitats. A number of resident and migrant bird species are expected to occur or have the potential for occurrence in forested dunes of the CMA. Of those, several are sensitive species. Special status species with known occurrence in in this habitat type include Cooper's hawk (*Accipiter cooperi*), great egret (*Ardea alba*), great blue heron (*Ardea herodias*), yellow warbler (*Dendroica petechia brewsteri*), snowy egret (*Egretta thula*), black-crowned night heron (*Nycticorax nycticorax*), osprey (*Pandion haliaetus*) and black-capped chickadee (*Poecile atricapilla*). Those with a high potential for occurrence include Vaux's swift (*Chaetura vauxi*) and purple martin (*Progne subis*). Sharp-shinned hawk *(Accipiter striatus*) has a low potential for occurrence.

Coastal beach pine forests have been assigned a global rank of G4 (greater than 100 viable occurrences world-wide and/or greater than 50,000 acres), a state rank of S2 (6-20 viable occurrences statewide and/or 2,000-10,000 acres), and a threat rank of 0.1 (very threatened) (CNDDB 2006). Forested dunes are considered Environmentally Sensitive Habitat Areas by the California Coastal Commission, and specifically identified as such under Section 3.30.B.1.a.2 of the Humboldt Bay Area Plan (HBAP) of the Humboldt County Local Coastal Program (LCP).

Dune Mat – Approximately 75 acres of dune mat are found within the nearshore dunes of the CMA. Dune mat is characterized by native, perennial forbs, grasses and low-growing shrubs growing on semi-stabilized nearshore dunes. Overall, plant species diversity is high in this vegetation type and cover varies from low to high. In many areas open sand is a significant component of the community. In the Humboldt Bay dunes, dune mat is represented by the Sand-verbena – beach bursage series described by Sawyer and Keeler-Wolf (1995) and Pickart & Sawyer (1998). Common species of this series include beach bursage (*Ambrosia chamissonis*), yellow sand-verbena (*Abronia latifolia*), beach pea (*Lathyrus littoralis*), dune goldenrod (*Solidago spathulata* ssp. *spathulata*), beach strawberry (*Fragaria chiloensis*), seaside daisy (*Erigeron glaucus*), beach morning glory (*Calystegia soldanella*), dune buckwheat (*Eriogonum latifolium*), dune sagebrush (*Artemisia pycnocephala*), seashore bluegrass (*Poa douglasii*), and beach evening primrose (*Camissonia cheiranthifolia*) (Pickart & Sawyer 1998).

Dune mat provides habitat for two federally listed endangered plant species that occur within the CMA, Humboldt Bay wallflower (*Erysimum menziesii* ssp. *eurekense*) and beach layia (*Layia carnosa*), two California Native Plant Society (CNPS) List 1B species, dark-eyed gilia (*Gilia millefoliata*) and pink sand verbena (*Abronia umbellata* ssp. *breviflora*), and a CNPS list 4 species, American glehnia (*Glehnia littoralis* ssp. *leiocarpa*).

Dune mat within the CMA supports a variety of wildlife, providing cover as well as serving as breeding and foraging habitat for several small mammals such as insectivores (shrews and moles) black-tailed jackrabbit and rodents (mice and voles). Some larger mammals also commonly utilize this habitat type for foraging, including long-tailed weasel, bobcat, gray fox, both striped and spotted skunk, and occasionally black-tailed deer (*Odocoileus hemionus*). Porcupines also use the nearshore dunes although their potential for occurrence is lower. Northern alligator lizard (*Elgaria coeruleus*) and California red-sided garter snake have been documented using the dune mat habitat.

Many avian species utilize the nearshore dunes within the CMA, particularly those raptor species that prey on small mammals. This community supports several sensitive avian species including northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus leucurus*), and short-eared owl (*Asio flammeus*). Rarely, stray burrowing owls *(Athene cunicularia)* have been observed in similar dune habitats on the South Spit of Humboldt Bay and at Centerville Beach near the mouth of the Eel River (S. McAllister, pers. obs. 2001-2003).

In the Humboldt Bay dunes, this community has been severely impacted by the spread of invasive exotic species, primarily European beachgrass (*Ammophila arenaria*), yellow bush lupine (*Lupinus arboreus*), and iceplant (*Carpobrotus edulis* x *C. chilensis*), and has been reduced to an estimated 17% (470 acres) of its original extent (Pickart & Sawyer 1998). The Native Dunegrass Series, occurring on the foredune, is recognized as a sensitive natural community, regardless of the degree of degradation by invasive exotic species, and is assigned a global rank of G2 (6-20 viable occurrences worldwide and/or 2000-10,000 acres), and state rank of S2 (6-20 viable occurrences statewide and/or 2,000-10,000 acres), and a threat rank of 0.1 (very threatened) (CNDDB 2006). Foredunes are considered Environmentally Sensitive Habitat Areas by the California Coastal Commission, and specifically identified as such under Section 3.30.B.1.a.2 of the HBAP of the Humboldt County LCP.

European Beachgrass – Approximately 25 acres of European beachgrass occur at the Ma-le'l Dunes CMA. Native to coastal dunes in Europe, European beachgrass is a prolific, rhizomatous grass that was introduced to the North Spit of Humboldt Bay in the early 1900's, where it was planted to stabilize moving sand. In northern California and Oregon, it is known to substantially alter the physical and biological conditions of the natural dune environment, consequently leading to a loss of native vegetation (Pickart & Sawyer 1998).

In the Humboldt Bay dunes, European beachgrass has displaced much of the native dunegrass (*Leymus mollis*) and dune mat vegetation. Few species are found in association with the European beachgrass series, but relict native species can occur in and on the periphery of this vegetation type. Foredunes dominated by European beachgrass tend to form steep, continuous ridges oriented parallel to the beach. These stabilized foredunes experience few "blowouts", reducing sand movement to the interior dunes.

Overall, wildlife use is limited in areas dominated by European beachgrass and species likely to occur are similar to those described for dune mat. However, European beachgrass has been demonstrated to increase the use of nearshore dunes by rodents and their predators (hawks) while invertebrate populations have been found to be greatly reduced following invasion.

Restoration efforts of native dune vegetation often involve the eradication of European beachgrass and other invasive exotics such as yellow bush lupine and iceplant. Efforts to eradicate non-native species from the nearshore dunes and forest have been underway since the early 1990's on the BLM Manila Dunes and since 1992 on the USFWS Fernstrom-Root parcel, and have been successful. The agencies have begun to focus restoration efforts on their new respective acquisitions, the Khoaghali and Buggy Club parcels. The majority of the existing European beachgrass within the Ma-le'l Dunes

CMA is found within the newly acquired, former "Buggy Club" parcel at Ma-le'l North, where restoration efforts are currently underway.

Lupine–Coyote Brush Scrub –The lupine-coyote brush scrub vegetation type occupies approximately 10 acres within the CMA, and is primarily found in the nearshore dunes of the newly acquired "Buggy Club" parcels at Ma-le'l North and Ma-le'l South. It is characterized by the presence of two-shrub species, yellow bush lupine (*Lupinus arboreus*) and coyote brush (*Baccharis pilularis*), occurring in varying degrees of dominance and cover. When one species is dominant, it comprises the Yellow bush lupine series or Coyote brush series described by Sawyer and Keeler-Wolf (1995). Wax myrtle and twinberry (*Lonicera involucrata*) may also be associated with these vegetation types, although at lower cover values. The shrub canopy may be intermittent or continuous, but is typically less than 2 m (6.6 ft) in height (Pickart & Sawyer 1998). The ground layer is variable, but European beachgrass and exotic annual grasses such as ripgut brome (*Bromus diandrus*), European hairgrass (*Aira caryophylla* and *A. praecox*), and vulpia (*Vulpia bromoides*) are common in the understory.

Yellow bush lupine is believed to be native to Sonoma and Ventura counties but has become naturalized locally. It is considered an invasive exotic species in Humboldt County where, like European beachgrass, it has a history of being planted to stabilize coastal dunes (Sawyer and Keeler-Wolf 1995). Yellow bush lupine acts as a catalyst for the invasion of other non-native species by increasing the levels of organic matter and releasing nitrogen to the surrounding substrate; thereby diminishing the competitive advantage native species have on the otherwise low-nutrient sand dunes (Pickart & Sawyer 1998). Although coyote brush is a native species, it is typically found on degraded dunes that have previously been stabilized by European beachgrass and/or yellow bush lupine. As with the European beachgrass, this vegetation type is the subject of eradication efforts to restore the nearshore dunes for native vegetation.

Lupine-coyote brush scrub within the CMA provides breeding and foraging habitat as well as cover for a variety of resident reptiles and mammals and both resident and migrant birds. The only sensitive wildlife species with the likelihood for occurrence within this habitat type is the Northern Harrier, which may use it as foraging habitat. Wildlife species occurring within this habitat include those species adapted to habitat edges.

Open Sand – Open sand represents approximately 130 acres within the CMA, and is the mapping unit used to delineate the beach and the moving dunes that are primarily unvegetated.

Also referred to as the littoral strip, the upper beach represents the area of loosely compacted sand that occurs between the tidal wash zone and the foredune. Abiotic factors and seasonal vegetation influence the landscape here. High winds, waves, cyclic tidal inundation, and sand transport by littoral action severely restrict plant growth. Drift accumulates here and new dunes form if the beach is accreting (i.e. expanding). Pioneer plant species such as the exotic but non-invasive sea rocket (*Cakile maritima* and *C. edentula*) and native dunegrass (*Leymus mollis*) become established in the summer but

are frequently removed by winter storm activity. European beachgrass may also colonize open sand areas, leading to the creation of very high, stable foredunes.

Moving dunes to the east also support little to no vegetation; however, sea rocket, yellow sand verbena, and the invasive European beachgrass are known to occur. These active, unstable, and windblown dunes do not provide optimal habitat conditions for endangered plants or associated dune mat species. However, the federally endangered beach layia and the CNPS list 1B plants dark-eyed gilia and pink sand verbenas are occasionally found growing here.

Open sand is a unique and important environment for a number of wildlife species and provides critical habitat for insects occurring within the CMA, most notably several species of bee and other pollinators.

Amphibian and reptile use of open sand occurs as these species transverse between the forest and swales or among swales. The special status northern red-legged frog inhabits dune swales adjacent to open sand and tracks made by western toads (*Bufo boreas*) foraging at night are occasionally observed on open sand at nearby sites (S. McAllister, pers. obs.).

Several species of seabirds, shorebirds, raptors, and landbirds frequent the beach of the CMA. This habitat type is unique because it is the area of interface between the ocean and upland dune habitats, allowing for a dynamic combination of bird species and interactions. For example, shorebirds of the open sand environment serve as a prey base for a number of raptor species. Many of the birds occurring or with the potential for occurrence in open sand are sensitive species. Of these, northern harrier, merlin (*Falco columbarius*), peregrine falcon (*Falco peregrinus*), osprey, California brown pelican (*Pelecanus occidentalis californicus*) and double-crested cormorant (*Phalacrocorax auritus*) are known to occur; elegant tern (*Sterna eleganus*) has a high potential for occurrence; western snowy plover (*Charadrius alexandrinus nivosus*) and long-billed curlew (*Numenius americanus*) have a moderate potential for occurrence and bald eagle (*Haliaeetus leucocephalus*) has a low potential for occurrence.

Terrestrial mammals that commonly use open sand include gray fox, raccoon, and striped skunk. Marine mammals occasionally use the beach to haul out when sick, distressed or molting. Harbor seals (*Phoca vitulina*) also use it as a haul out during their pupping season.

Beaches and moving dunes are part of the active coastal dune system, which have been assigned a global rank of G3 (21-100 viable occurrences worldwide and/or 10,000-50,000 acres), a state rank of S2 (6-20 viable occurrences statewide and/or 2,000-10,000 acres), and a threat rank of 0.2 (threatened) (CNDDB 2006). These habitats are considered Environmentally Sensitive Habitat Areas by the California Coastal Commission, and specifically identified as such under Section 3.30.B.1.a.2 of the HBAP of the Humboldt County LCP.

Dune Swale – Dune swales occupy approximately 50 acres of the Ma-le'l Dunes CMA. Also known as dune hollows, dune swales are seasonal, freshwater wetlands that form in the nearshore dunes. During the spring and summer months, strong prevailing winds

erode the sand down to the summer water table. When the water table rises in the winter, ephemeral ponds are formed and colonized by hydrophytic vegetation.

There are two vegetation types associated with dune swales: herbaceous and woody. Herbaceous swales are typically dominated by Brewer's rush (*Juncus breweri*) and/or slough sedge (*Carex obnupta*), the latter classified as the Sedge series by Sawyer and Keeler-Wolf (1995) and associated with areas that exhibit more persistent wetland hydrology. Over a period of just a few years, herbaceous swales can succeed to woody swales. Hooker willow (*Salix hookeriana*) is usually the first to colonize herbaceous swales, comprising the Hooker willow Series described by Sawyer and Keeler-Wolf (1995). Beach pine may also dominate, forming the Beach pine series. Both series may support wax myrtle (*Myrica californica*), red alder (*Alnus rubra*), and occasionally Sitka spruce. Woody swales often have an understory dominated by Brewer's rush and/or slough sedge.

Dune swales may provide breeding habitat for amphibians and reptiles such as northwestern salamander, rough-skinned newt, Pacific chorus frog, California red-sided garter snake and the special status northern red-legged frog and northwestern pond turtle. Swales that lack a surface water component year round are less likely to be used by wildlife that depends on aquatic resources.

Avian species occurring within this habitat type include resident and breeding black-capped chickadee and migrant yellow warbler, both with known occurrence at the CMA, and raptors such as Cooper's (present) and sharp-shinned (low potential) hawks that may hunt here during migration and winter.

Mammalian species likely to occur include several resident small mammals of the orders Insectivora and Rodentia that use dune swales for breeding, foraging, and cover. Medium and large mammals such as Virginia opossum, brush rabbit, black-tailed jackrabbit, porcupine, gray fox, raccoon, long-tailed weasel, mink, spotted skunk, striped skunk, bobcat and black-tailed deer also use this habitat for foraging and cover. In addition, bats may forage seasonally within dune swales.

Under the Cowardin wetland classification system (Cowardin ET AL. 1979), dune swales are considered part of the Palustrine System, Emergent Class, Persistent Subclass, with a seasonally flooded water regime. Vegetated dune swales are considered Waters of the U.S. and are regulated by the United States Army Corps of Engineers (Corps) under section 404 of the Federal Clean Water Act. They also fall within the jurisdiction of the California Coastal Commission as Coastal Act wetlands, and are identified as Environmentally Sensitive Habitat Areas under Section 3.30.B.1.a.2 of the HBAP of the Humboldt County LCP. The California Department of Fish and Game does not distinguish dune hollows from other freshwater marshes and swamps, which are afforded a global rank of G2 (6-20 viable occurrences worldwide and/or 2000-10,000 acres), a state rank of S2 (6-20 viable occurrences statewide and/or 2,000-10,000 acres), and a threat rank of 0.2 (threatened) (CNDDB 2006).

Riparian /Freshwater Swamp – Riparian and freshwater swamp accounts for approximately 15 acres of the CMA. This habitat is found at Ma-le'l North and Ma-le'l South in depressions within the coniferous forest that are seasonally to permanently

flooded by fresh water. They typically occur at the interface between moving dunes and stabilized forested dunes, along persistent water courses (Iron Creek), but are also found adjacent to the brackish and salt marsh habitats of the Mad River Slough.

Successionally more developed than dune swales; riparian swamps, have a higher cover of trees and shrubs. At the Ma-le'l Dunes CMA, Red Alder and Hooker Willow are the dominant vegetation series found within this habitat where they frequently intermix. Common shrubs include wax myrtle, California blackberry, cascara (*Rhamnus purshiana)*, red elderberry (*Sambucus racemosa*), and salmonberry (*Rubus spectabilis*). Red alder is more commonly found in riparian positions that may also support an herb layer of skunk cabbage (*Lysichiton americanum*), lady fern (*Athyrium filix-femina*), hedge nettle (*Stachys chamissonis*), pacific silverweed and a number of sedges and rushes.

Riparian/freshwater swamp provides the best habitat for aquatic amphibians and reptiles within the CMA. Terrestrial species may also frequent swamp edges. Those species likely to inhabit this community include rough-skinned newt, Pacific chorus frog and California red-sided garter snake as well as the special status red-legged frog, with known occurrence in the CMA, and northwestern pond turtle with a moderate potential for occurrence.

This community is also essential for birds and, within and adjacent to the CMA, riparian/ freshwater swamp reportedly supports among the highest densities of landbirds recorded in North America (USUSFWS 2000). A multitude of both resident and migrant landbirds use this habitat for breeding, foraging and cover, including special status species such as yellow warbler and black-capped chickadee with known occurrence, Vaux's swift with a high potential for occurrence, and willow flycatcher with a low potential for occurrence. Four species of special status waterbirds, great egret, great blue heron, snowy egret and black-crowned night heron also forage and roost at the margins of riparian swamps. Raptors such as the special status peregrine falcon and osprey occur here as well. An osprey nest is currently active in a snag within a riparian marsh at Ma-le'l North, approximately 50 m from the railroad berm trail at the site of the proposed wetland view deck.

Mammals such as long-tailed weasel, gray fox, both striped and spotted skunks and mink probably frequent freshwater/riparian swamp margins for foraging and cover. However, no special status mammals are likely to occur.

Where areal tree cover is 30% or greater, this habitat belongs to the Forested Class, Broad-leaved Deciduous Subclass of the Palustrine Wetland System. Where trees or shrubs alone cover less than 30% of an area but in combination cover 30% or more, the wetland is assigned to the Scrub-shrub Class, Broad-leaved Deciduous Subclass (Cowardin ET AL. 1979). This typically occurs at ecotones between the freshwater swamps, which are classified under the Emergent Subclass and Persistent Subclass, and the forested alder habitat.

Riparian and freshwater swamps are considered Waters of the U.S. and are regulated by the Corps under section 404 of the Federal Clean Water Act. They also fall within the jurisdiction of the California Coastal Commission as Coastal Act wetlands, and are identified as Environmentally Sensitive Habitat Areas under Section 3.30.B.1.a.1 of the

HBAP of the Humboldt County LCP. Freshwater swamps are afforded a global rank of G2 (6-20 viable occurrences worldwide and/or 2000-10,000 acres), a state rank of S2 (6-20 viable occurrences statewide and/or 2,000-10,000 acres), and a threat rank of 0.2 (threatened) (CNDDB 2006).

Brackish Marsh – There are approximately 5 acres of brackish marsh within the CMA, occupying a linear strip of vegetation between the salt marsh and coniferous forest at Ma-le'l North. A brackish marsh shares attributes of both salt marsh and freshwater marsh systems. At the CMA, brackish areas are influenced by the semi-diurnal tide cycle of the slough but they receive sufficient freshwater input from the adjacent riparian swamp and/or runoff from the upland forest to support brackish species such as seacoast bulrush (*Scirpus maritimus*), cattail (*Typha latifolia*), slough sedge, salt grass (*Distichlis spicata*), salt rush (*Juncus lesueurii*), Lyngbye's sedge (*Carex lyngbyei*), a CNPS List 2 species, and sea watch (*Angelica lucida*), a CNPS list 4 species.

Many species of birds utilize brackish marsh for breeding, foraging and cover. This system supports a variety of gastropods, polychaetes and crustaceans (Barnhart et al. 1992) that form a prey base for a multitude of birds including special status herons and egrets (great egret, great blue heron, snowy egret and black-crowned night heron), short-eared owl, northern harrier, white-tailed kite, merlin, peregrine falcon, bald eagle and long-billed curlew. Mammals such as raccoon, both striped and spotted skunk, long-tailed weasel, river otter and mink are also likely to frequent the brackish marsh system.

Water chemistry will fluctuate in this habitat in response to tide cycles and seasonally with an increase in runoff during the rainy season; however, they are typically considered part of the Estuarine System, Intertidal Subsystem, Emergent Wetland Class, and Persistent Subclass, intermittently flooded, with a mixohaline (brackish) water chemistry (Cowardin ET AL. 1972). They are considered Waters of the U.S. and are regulated by the Corps under section 404 of the Federal Clean Water Act. They also fall within the jurisdiction of the California Coastal Commission as Coastal Act wetlands, and are identified as Environmentally Sensitive Habitat Areas under Section 3.30.B.1.a.1 of the HBAP of the Humboldt County LCP. Mixohaline estuarine systems are afforded a global rank of G2 (6-20 viable occurrences worldwide and/or 2000-10,000 acres), a state rank of S3 (21-100 viable occurrences statewide and/or 10,000-50,000 acres) and a threat rank of 0.2 (threatened) (CNDDB 2006).

Salt Marsh – There are approximately 35 acres of salt marsh within the CMA, located along the mainland and on islands of the Mad River Slough at Ma-le'l North. Island marshes typically support a more diverse plant assemblage than mainland marshes and are found at slightly higher elevations, generally greater than 7.3 feet MLLW. Eicher (1987) described the plant community of the high elevation salt marsh as the mixed marsh type, which is known to support up to twenty-two different plant species, none representing more than 25% of the total vegetative cover. Common representative species include saltgrass, pickleweed (*Salicornia virginica*), jaumea (*Jaumea carnosa*), arrowgrass (*Triglochin maritima* and *T. concinna),* and marsh rosemary (*Limonium californicum*). The mixed marsh type is optimal habitat for the rare Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. *humboldtiensis*) and Point Reyes bird's-beak

(*Cordylanthus maritimus* ssp. *palustris*) whose nearby occurrences have been mapped by USFWS.

The mixed marsh subtype may also be found along mainland banks of the slough, however, the Cordgrass and Pickleweed vegetation series are more common than mixed marsh, especially at lower tidal elevations. The Pickleweed series supports some of the same species as the mixed marsh subtype, but pickleweed accounts for approximately 70% of the total vegetative cover, and it is typically found at elevations below 6.9 feet MLLW. The Cordgrass series occurs primarily at mid-tidal elevations (6.9 -7.3 feet MLLW). It is characterized by a predominance of dense-flowered cordgrass (*Spartina densiflora*), which is an invasive, introduced species that has spread extensively throughout Humboldt Bay. It is a co-dominant in dense mid-tidal elevation stands of pickleweed. It should be noted that recent studies have found cordgrass increasingly encroaching into the pickleweed subtypes, and to a lesser extent, the mixed marsh subtype (Pickart 2001).

Like brackish marsh, salt marsh habitats are highly productive, inhabited by a variety of gastropods, polychaetes and crustaceans, and support similar wildlife assemblages. Many species of birds utilize salt marsh and include special status species such as herons and egrets (great egret, great blue heron, snowy egret and black-crowned night heron), short-eared owl, northern harrier, white-tailed kite, merlin, peregrine falcon, bald eagle and long-billed curlew, primarily as foragers. Additionally, salt marsh habitats are used extensively for roosting sites by shore birds, such as willets, during high tides.

Mammals such as raccoon, both striped and spotted skunk, long-tailed weasel, river otter and mink are also likely to occur.

Salt marsh habitats within the CMA are part of the Estuarine System, Intertidal Subsystem, Emergent Wetland Class, Persistent Subclass (Cowardin ET AL. 1972). The soils are hydric, and influenced by a water regime that varies from regularly to irregularly flooded, with water chemistry that may be hyperhaline (dominance of ocean salts) to mixohaline (brackish). They are Waters of the U.S. and are regulated by the Corps under section 404 of the Federal Clean Water Act. They also fall within the jurisdiction of the California Coastal Commission as Coastal Act wetlands, and are identified as Environmentally Sensitive Habitat Areas under Section 3.30.B.1.a.3 of the HBAP of the Humboldt County LCP. Salt marsh habitats such as these have been assigned a global rank of G3 (21-100 viable occurrences worldwide and/or 10,000-50,000 acres), a state rank of S3 (21-100 viable occurrences statewide and/or 10,000-50,000 acres), and a threat rank of 0.2 (threatened) (CNDDB 2006). As much as 90% of the historic salt marsh around Humboldt Bay has been lost due to development (Shapiro and Associates 1980).

Threatened, Endangered, and Special Status Species

Definition of Special Status Species

For the purposes of this analysis and following common practice, “special-status species” are defined as those plants and animals that are legally protected under the State and Federal Endangered Species Acts (ESA) and other regulations, and species that are

considered rare by the scientific community. Rare, endangered, or threatened species are protected by the Federal Endangered Species Act of 1973 (as updated in 50 CFR § 17.11 and 17.12, January 1992), the California Native Plant Protection Act of 1997, and the California Endangered Species Act of 1970 (California Administrative Code Title 14, section 670.2 and 670.51). The California Environmental Quality Act (CEQA) (January 1984) provides additional protection for listed species that meet the Rare or Endangered criteria defined in section 15380.

(a) Federal Endangered Species (FE). A species listed as Endangered under the Federal ESA is on the brink of extinction as determined through a strict legal and scientific listing process. This gives the species protection under Section 9 of the Federal ESA which prohibits the "take" of any Endangered species. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

(b) Federal Threatened Species (FT). A species listed as Threatened under the Federal ESA is experiencing serious threats that may eventually lead to its extinction, but the situation is not yet critical. Those species listed as Federally Threatened are not automatically protected under the Act although most of the same protection that applies to Federally listed Endangered species applies to Threatened species as authorized through Section 4(d) of the Act. Therefore, unauthorized "take" (i.e. harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) is not permitted. Exceptions to the "take" rule, often referred to as 4(d) rules, can be authorized by the United States Fish and Wildlife Service. The Service can also authorize the issuance of "take" permits to allow the "take" of a Federally Threatened species as part of an otherwise lawful activity.

(c) Federal Candidate Species (FC). Federal Candidate species are those species for which enough data has been collected to support a proposal to list the species as either Threatened or Endangered under the Federal ESA. Federal Candidate species are not protected under the ESA and are not considered herein.

(d) Federal Species of Concern (FSC). Federal Species of Concern are species for which the data are insufficient at this time to support a federal listing proposal. Additional field research and data collection are necessary in order to classify these species as either candidates for listing or remove them from consideration. Federal species of concern are not protected under the Federal Endangered Species Act.

(e) State Endangered Species (SE). A species listed as Endangered under the California Endangered Species Act (CESA), administered by the California Department of Fish and Game (CDFG), is "in serious danger of becoming extinct throughout all, or a significant portion of its range" and is limited to species or subspecies native to California (§2062). "Take" ("to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") is prohibited under CESA except as otherwise provided in State law.

(f) State Threatened Species (ST). A species listed as Threatened under the CESA (§ 2067) is "a native species or subspecies that although not presently threatened with extinction, is likely to become an Endangered species in the foreseeable future" in the absence of the special protection and management efforts required in the CESA chapter of the Fish and Game Code Section 2050-2068. Any animal determined to be "rare" by the Fish and Game Commission on or before January 1, 1985 is a Threatened species.

(g) State Fully Protected Animals (CFP). Fully Protected Animals are protected under California Fish and Game Code §§3511 (birds), 4700 (mammals) and 5050 (amphibians). State fully protected animals or parts thereof may not be taken or possessed at any time except for the following cases: 1) the California Fish and Game Commission may authorize the collecting of such species for necessary scientific research and may authorize the live capture and relocation of such species pursuant to a permit for the protection of livestock, and 2) legally imported fully protected animals or parts thereof may be possessed under a permit issued by the CDFG.

(h) State Species of Special Concern (CSC). California Species of Special Concern are species listed by the CDFG as those California breeding populations that are seriously declining with the possibility of extirpation from all or a portion of their range. This designation affords no legally mandated protection. However, pursuant to the CEQA Guidelines, some species of special concern would be considered Rare. Any unmitigated impacts to rare species would be considered under the CEQA Guidelines to be a "significant effect on the environment." Thus, Species of Special Concern must be considered in any project that will or is currently undergoing CEQA review and/or must obtain an environmental permit(s) from a public agency.

(i) California Native Plant Society List Species. The California Native Plant Society (CNPS) maintains an inventory that includes five lists for categorizing plant species of concern. List 1 species have the highest priority: List 1A species are thought to be extinct and List 1B species are known to still exist. List 2 species are rare in California, but more common elsewhere. Lists 3 and 4 contain species about which there is some concern; these are "review" and "watch" lists, respectively. The plants on the CNPS list 1B and 2 are considered rare, endangered, and threatened plants pursuant to Section 15380 of the CEQA Guidelines. The plants on these lists meet the definitions under the Native Plant Protection Act and/or the California Endangered Species Act of the California Department of Fish and Game Code and are eligible for state listing. CDFG requests the inclusion of List 1 and List 2 species in environmental documents. In addition, other state and local agencies may request the inclusion of species on other lists as well.

(j) California Natural Diversity Data Base. CDFG maintains records for the distribution and known occurrences of special status species and natural communities in the California Natural Diversity Database (CNDDB). It is organized into map areas based on 7.5 minute topographic quadrangles produced by the U.S. Geological Survey. The database gives detailed information on each occurrence, including specific location of the individual, population, or habitat (if possible) and the presumed current state of the population or habitat. Sensitive species and natural communities are also ranked in the database by their rarity and threat status, as defined below:

Global Ranking

The global rank (G-rank) is a reflection of the overall condition of an element throughout its global range.

Species or Community Level

G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres.
G2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres.
G3 = 21-80 EOs OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4 = Greater than 100 viable occurrences worldwide and/or greater than 50,000 acres
G5 = Community demonstrably secure due to worldwide abundance

Subspecies Level:

Subspecies receive a T-rank attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety. The five T-rank categories are the same as the G-rank categories listed above, but again, apply only to subspecies or varieties.

State Ranking

The state rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank (S1 through S5)

State threat ranks include:

0.1: Very threatened
0.2: Threatened
0.3: No current threats known

Methodology for Determining Occurrence or Potential Occurrence of Special Status Species within the CMA

The CNDDB and CNPS inventory were queried for the project region in May of 2006. The project region was defined as the Eureka 7.5 minute USGS quadrangle and six adjacent coastal quadrangles (Arcata North, Arcata South, Tyee City, Fields Landing, Cannibal Island, and McWhinney Creek). Table 4 includes a list of regional special status plants and animals compiled for the CMA based on the results of data base queries, data provided by BLM and USFWS CMA resource managers, review of pertinent literature, and informal consultation with public agencies and other knowledgeable individuals.

The absence of a particular special-status plant or animal from the report does not necessarily mean that it is absent from the study area, only that no occurrence records exist in the CNDDB or CNPS inventories for the project region, and it has not been detected within the CMA to date. Habitat suitability was evaluated for all special-status species addressed in the biological study by using the following criteria:

(1) **Present.** The species is known to occur within the CMA, based on historical occurrence records and/or recent survey data.

(2) **High Potential.** Habitat components meeting the species requirements are present and most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found in the CMA.

(3) **Moderate Potential.** Habitat components meeting the species requirements are present; however, some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found in the CMA.

(4) **Low Potential.** Some habitat components meeting the species requirements are present; however, the majority of habitat on and adjacent to the site is unsuitable. The species has a low probability of being found in the CMA.

(5) **Not Present.** Habitat on and adjacent to the site is clearly unsuitable for the species or recent survey data indicates that it currently does not occur within the CMA.

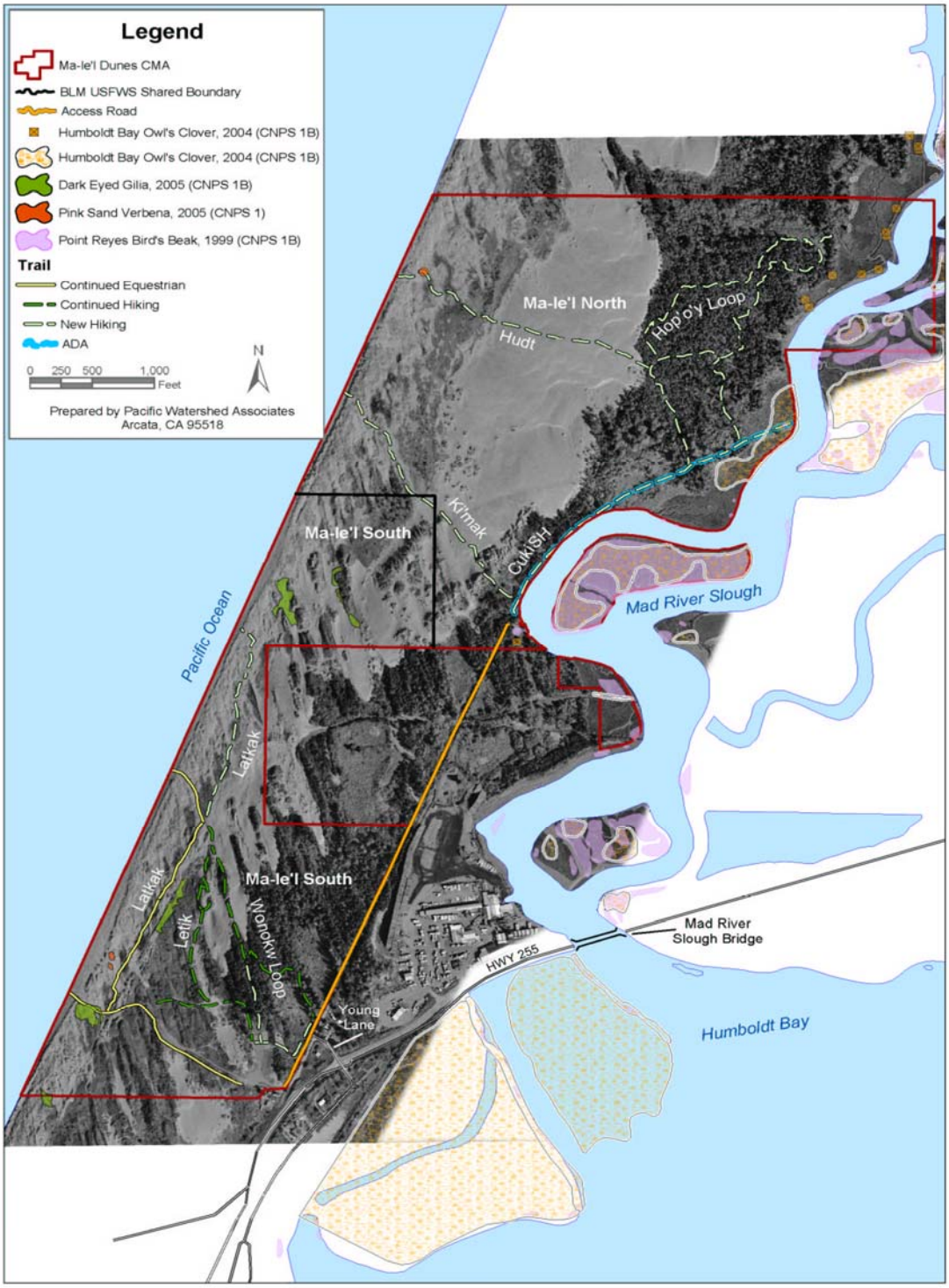

Fig6_malel_special_IS_EA_08112006.pdf

Figure 6. Special Status Species at the Ma-le'l Dunes CMA

Table 4. Special Status Species Addressed for the Ma-le'l Dunes Cooperative Management Area Public Access Plan

Plant Species	Status *	Habitat Characteristics (CNDDB 2006)[2]	Potential for Occurrence at the CMA
Abronia umbellata ssp. *breviflora* pink sand verbena	List 1B.1 G4G5T2/S2.1	Coastal dunes and coastal strand from north coast of California into Oregon. Foredunes and interior dunes with sparse cover; 0-12m.	**Present.** Pink sand verbena occurs in the nearshore dunes of the CMA and adjacent foredune habitats of the North Spit.
Angelica lucida sea watch	List 4.2 G5/S2S3	Coastal bluff scrub, coastal dunes, coastal scrub, coastal salt marshes; 0-150m.	**Present.** Occurrences of sea watch have not been mapped within the CMA, but the species reportedly occurs with the brackish marsh habitats at Ma-le'l North (pers. comm. Andrea Pickart October 2006).
Astragalus pycnostachyus var. *pycnostachyus* coastal marsh milk-vetch	List 1B.2 G2T2/S2.2	Mesic sites in dunes or along streams or coastal salt marsh; 0-3m.	**Low Potential.** There are historical records for coastal marsh-milk vetch on the North Spit and suitable habitat does occur within the CMA, however, it has not been documented within the project area to date.
Carex arcta northern clustered sedge	List 2.2 G5/S1S2	Bogs and fens, North Coast coniferous forest (mesic); 60-1,400m.	**Low Potential.** No occurrence records for northern clustered sedge on the North Spit and it has not been documented within the CMA to date, although potentially suitable habitat areas (riparian swamp) may not have been thoroughly surveyed for this species.
Carex leptalea flaccid sedge	List 2.2 G5/S2?	Bogs and fens, meadows (mesic), marshes and swamps; 0-790m.	**Low Potential.** No occurrence records for flaccid sedge on the North Spit and it has not been documented within the CMA to date, although potentially suitable habitat areas (riparian swamp) may not have been thoroughly surveyed for this species.

[2] *California Department of Fish and Game Natural Diversity Data Base. 2006.*

Plant Species	Status *	Habitat Characteristics (CNDDB 2006)[2]	Potential for Occurrence at the CMA
Carex lyngbyei Lyngbye's sedge	List 2.2 G5/S2.2	Marshes and swamps (brackish or freshwater); 0-10m	**Present.** Lyngbye's sedge was observed along a mainland bank of the Mad River Slough at Ma-le'l North during a reconnaissance site visit in 2006 by Mad River Biologists. The USFWS is aware of this occurrence; however, it has not been mapped for the CMA Public Access Plan or related biological studies.
Carex praticola meadow sedge	List 2.2 G5/S2S3	Moist to wet meadows; 0-3200m.	**Low Potential.** There are no records for meadow sedge on the North Spit, and it has not been documented within the CMA to date.
Castilleja affinis ssp. *litoralis* Oregon coast Indian paintbrush	List 2.2 G4G5T4/S2.2	Coastal bluff scrub, coastal dunes, coastal scrub/ sandy; 15-100m.	**Low Potential / Not Present.** Suitable habitat within the CMA includes undeveloped dunes; however, this species is not known to occur on the North Spit, and it has not been detected within the CMA to date. There is reasonable certainty that it does not occur within the nearshore dunes of the CMA.
Castilleja ambigua ssp. *humboldtiensis* Humboldt Bay owl's-clover	List 1B.2 G4T2/S2.2	Found in coastal salt marsh habitat, in association with *Spartina, Distichlis, Salicornia, Jaumea*. 0-3m. Known only from Humboldt and Marin Counties.	**Present.** This species occurs on island and mainland salt marsh habitats of the CMA. It occurs on the mainland at the end of the Railroad berm trail at Ma-le'l North.
Cordylanthus maritimus ssp. *palustris* Point Reyes bird's-beak	List 1B.2 G4?T2/S2.2	Found in coastal salt marsh habitat, in association with *Spartina, Distichlis, Salicornia, Jaumea*, etc.; 0-15m.	**Present.** The majority of the bird's-beak within the CMA is found on island salt marshes, but small occurrences have been mapped on the mainland at Ma-le'l North on a small promontory south of the proposed boat landing and north of Sierra Pacific Industries.

Plant Species	Status *	Habitat Characteristics (CNDDB 2006)[2]	Potential for Occurrence at the CMA
Erysimum menziesii ssp. *eurekense* Humboldt Bay wallflower	FE, SE List 1B.1 G3?T1/S1.1	Endemic to coastal dunes (foredunes) around Humboldt Bay; 0-10m.	**Present.** Humboldt Bay wallflower occurs in the nearshore dunes of Ma-le'l South and Ma-le'l North, found primarily in the dune mat vegetation type.
Erythronium revolutum coast fawn lily	List 2.2 G4/S2.2	Bogs and fens, Broadleafed upland forest, North Coast coniferous forest / mesic, streambanks; 0-1065m.	**Not Present.** There are no occurrence records for coast fawn lily on the North Spit, and it has not been detected within the CMA to date.
Fissidins pauperculus minute pocket-moss	List 1B.2 G3?/S1.2	North coast coniferous forests (damp coastal soil); 10-100m.	**Low Potential.** The beach pine/Sitka spruce forest may be suitable for this moss; however, it has not been detected within the CMA and no occurrence records exist for the North Spit.
Gilia capitata ssp. *pacifica* Pacific gilia	List 1B.2 G5T3T4/S2.2 ?	Coastal bluff scrub, coastal prairie, valley and foothill grasslands; 5-300m.	**Low Potential.** There are no occurrence records for Pacific gilia on the North Spit and it has not been detected within the CMA to date. Potential suitable habitat is limited within the project area.
Gilia millefoliata dark-eyed gilia	List 1B.2 G2/S2.2	Coastal dunes; 2-20m.	**Present.** Occurrences of dark-eyed gilia have been mapped within the nearshore dunes at Ma-le'l South. This species is also likely to occur at Ma-le'l North, although it has not been documented here.
Glehnia littoralis ssp. *leiocarpa* American glehnia	List 4.2 G5T5/S3.2	Coastal dunes; 0-20m.	**Present.** Occurrences of American glehnia have not been mapped within the CMA but suitable habitat includes the nearshore dunes. It was observed at Ma-le'l North during a site visit in 2006.

Plant Species	Status *	Habitat Characteristics (CNDDB 2006)[2]	Potential for Occurrence at the CMA
Hesperevax sparsiflora var. *brevifolia* Short-leaved evax	List 2.2 G4T3/S3.2	Coastal bluff scrub, coastal dunes, sandy bluffs and flats; 0-200m.	**Moderate Potential.** This species has not been documented within the CMA but a population is known from the North Spit near the Samoa drag strip and Airport and near the town of Manila. Suitable habitat is present at the CMA. This annual species withers rapidly after setting seed and is often overlooked due to its diminutive size.
Lathyrus japonicus sand pea	List 2.1 G5/S1.1	Coastal dunes, 1-30m.	**Moderate Potential**. Historical occurrences of sand pea are known from the North Spit, and suitable habitat includes undeveloped dunes; however, this species has not been documented within the CMA. There is reasonable certainty that it does not occur within the nearshore dunes of the CMA based on recent survey efforts.
Lathyrus palustris marsh pea	List 2.2 G5/S2S3	Bogs and fens, mesic sites in lower montane coniferous forest, marshes and swamps, North Coast coniferous forest, coastal prairie, and coastal scrub; 1-100m.	**Low Potential.** There is an occurrence record of marsh pea near the town of Samoa in the CNDDB; however, this species has not been documented within the CMA. Potentially suitable habitat areas (i.e. riparian swamp) may not have been thoroughly surveyed for this species.
Layia carnosa beach layia	FE, SE List 1B.1 G1/S1.1	On sparsely vegetated, semi-stabilized dunes, usually behind foredunes; 0-75m.	**Present.** Beach layia is locally common in the nearshore dunes of the CMA.
Lilium occidentale western lily	FE, SE List 1B.1 G1/S1.2	Coastal scrub, freshwater marsh, bogs and fens, coastal bluff scrub, coastal prairie, North Coast coniferous forest. On well-drained, old beach washes overlain with wind-blown alluvium and original topsoil; usually near	**Not Present.** No occurrence records exist for the North Spit, and suitable habitat conditions are not present within the CMA (pers. comm. David Imper 2006).

Plant Species	Status *	Habitat Characteristics (CNDDB 2006)[2]	Potential for Occurrence at the CMA
		margins of Sitka spruce; 2-185m.	
Lycopodium clavatum Running-pine	List 2.3 G5/S2S3	In California, known only from Humboldt County. North Coast coniferous forest, marshes and swamps; forest floors in shady and semi-exposed mesic areas, 45-1640m.	**Not present.** Running pine has not been documented within the CMA and no occurrence records presently exist for the North Spit.
Mitella caulescens leafy-stemmed mitrewort	List 4.2 G5/S4.2	Broadleaved upland forests, lower montane coniferous forests, meadows and seeps, North Coast coniferous forests/mesic; 6-1710m.	**Not Present.** No occurrence records exist for the North Spit, and suitable habitat conditions are highly limited within the CMA. This species was recently down listed to CNPS list 4 from CNPS List 2.
Monotropa uniflora Indian pipe	List 2.2 G5/S2S3	Broadleaved upland forest, North Coast coniferous forest; often under redwoods or western hemlock; 10-200m.	**Not Present.** Indian pipe has not been documented from the North Spit, and suitable habitat is not present within the CMA.
Montia howellii Howell's montia	List 2.2 G3G4/S1.2	Meadows, North Coast coniferous forests, vernal pools. Vernally mesic sites; often on compacted soil. 0-400m. Rediscovered in California in 1999.	**Not Present.** No occurrence records exist for Howell's montia on the North Spit, and known habitat characteristics are not present within the CMA.
Puccinellia pumila dwarf alkali grass	List 2.2 G4?/S1.1?	In California, known only from Humboldt and Mendocino counties. Mineral spring meadows and coastal salt marshes; 1-10m.	**Low Potential.** Suitable habitat for dwarf alkali grass may include the estuarine wetlands of the Mad River Slough at Ma-le'l North, although this species has not been documented within the CMA to date.
Sidalcea malachroides maple-leaved checkerbloom	List 4.2 G3/S3.2	Broadleaved upland forest, coastal prairie, coastal scrub, and North Coast coniferous forest. Woodlands and clearings near coast; often in disturbed areas; 2-760m.	**Not Present.** Maple-leaved checkerbloom is not known to occur on the North Spit, and habitat components meeting this species' requirements are limited within the CMA.

Plant Species	Status *	Habitat Characteristics (CNDDB 2006)[2]	Potential for Occurrence at the CMA
Sidalcea malviflora ssp. patula Siskiyou checkerbloom	List 1B.2 G5T1/S1.1	Coastal prairie, broad-leaved upland forest. Open coastal forest; 15-65m.	**Not Present**. Siskiyou checkerbloom is not known to occur on the North Spit, and habitat components meeting this species' requirements are limited within the CMA.
Sidalcea oregana ssp. eximia coast checkerbloom	List 1B.2 G5T1/S1.2	Endemic to Humboldt County. Meadows and seeps, North Coast coniferous forest, and lower montane coniferous forest; 0-1800m.	**Not Present**. Coast checkerbloom is not known to occur on the North Spit, and habitat components meeting this species' requirements are limited within the CMA.
Spergularia canadensis var. occidentalis western sand spurry	List 2.1 G5T4?/S1.1	Coastal salt marsh; 0-3 m.	**High Potential.** Suitable habitat for western sand spurry includes the estuarine wetlands of the Mad River Slough at Ma-le'l North. Although this species has not been documented within the CMA, it has been documented in salt marsh habitats at Lanphere Dunes.
Usnea longissima long-beard lichen	CLS Red List w/List 1B recommende d G4/S4.2	North coast coniferous forest and broadleaved upland forest. Grows in the "redwood zone" on a variety of trees, including big leaf maple, oaks, ash, Douglas-fir, and bay; 0-2000 ft. in California.	**Not Present.** Long-beard lichen is not presently known to occur on the North Spit. There is no suitable habitat for this species within the CMA.
Viola palustris marsh violet	List 2.2 G5/S1S2	Swampy, shrubby places in coastal scrub or coastal bogs; 0-15m.	**Low to Moderate Potential.** Marsh violet has not been reported from CMA, although suitable habitat does exist and there are historical occurrences for this species on the North Spit. Suitable habitat areas (i.e. riparian swamp) may not have been thoroughly surveyed for this species.

Insect Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Cicindela hirticollis gravida sandy beach tiger beetle	G5T2/S1	Inhabits areas adjacent to non-brackish water along the coast of California from the San Francisco Bay to northern Mexico. Habitat includes clean, dry, light-colored sand in the upper zone. Subterranean larvae prefer moist sand not affect by wave action.	**Not Present.** Although historic occurrence records exist for both the Eureka and Arcata South quadrangles; sandy beach tiger beetle is considered extirpated, locally. Potentially suitable habitat within the CMA occurs is association with the freshwater riparian swamp and dune swales.

Fish Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Eucuclogobius newberryi tidewater goby	FE, CSC G3/S2S3	Occurs in brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, tidewater goby needs fairly still but not stagnant water and high oxygen levels.	**High Potential.** Tidewater goby is known to occur within Humboldt Bay and has been detected in the Mad River Slough area of the Bay (NE portion of the Arcata Bay near H Street) as recently as 2000 (Greg Goldsmith, USFWS, pers. comm.). The Mad River Slough, bordering the project area contains suitable habitat for tidewater goby. The CMA falls within critical habitat for this species.
Oncorhynchus clarki clarki coast cutthroat trout	CSC G4T4/S3	Small, low gradient coastal streams and estuaries from the Eel River in California to the Oregon border. Needs shaded streams with water temperatures <18° C and small gravel for spawning.	**High Potential.** Coast cutthroat trout are known to occur in Humboldt Bay which is contiguous with the Mad River slough adjoining the CMA.
Oncorhynchus kisutch coho salmon - southern Oregon/northern California ESU	FT, ST G4T2Q/S2?	The federal listing refers to populations between Cape Blanco, Oregon and Punta Gorda, Humboldt County, California. The state listing refers to populations between the Oregon border and Punta Gorda, California.	**High Potenital.** Coho salmon are known to occur in Humboldt Bay which is contiguous with the Mad River slough adjoining the CMA. The CMA also falls within critical habitat for the southern Oregon/northern California ESU (Rick Rogers, NOAA Fisheries, pers. comm.).

Fish Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Oncorhynchus mykiss irideus Steelhead – northern California ESU	FT G5T2Q/S2	Inhabits coastal basins from Redwood Creek, Humboldt County south to the Gualala River, Mendocino County. Listing does not include summer-run steelhead.	**High Potenital.** Steelhead is known to occur in Humboldt Bay which is contiguous with the Mad River slough adjoining the CMA. The CMA also falls within critical habitat for the northern California ESU (Rick Rogers, NOAA Fisheries, pers. comm.).
Oncorhynchus tshawytscha Chinook Salmon – California coastal ESU	FT G5T2Q/S1	Federal listing refers to wild spawned, coastal, spring and fall runs between Redwood Creek, Humboldt County and the Russian River, Sonoma County.	**High Potenital.** Chinook salmon is known to occur in Humboldt Bay which is contiguous with the Mad River slough adjoining the CMA. The CMA also falls within critical habitat for California coastal ESU (Rick Rogers, NOAA Fisheries, pers. comm.).

Amphibian Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Ascaphus truei western tailed frog	CSC G4/S2S3	Restricted to perennial montane streams of montane hardwood-conifer, redwood, Douglas-fir, ponderosa pine habitats. Tadpoles require water below 15ºC.	**Not Present.** Suitable habitat does not occur within the CMA.
Rana aurora aurora northern red-legged frog	CSC G4T4/S2?	Found in humid forests, woodland, grasslands, and streamsides in northwestern California, generally near permanent water. They can be found far from water, in damp woods and meadows during the non-breeding season.	**Present.** Northern red-legged frog is known to occur in dune swales and freshwater/riparian swamp throughout the CMA.
Rhyacotriton variegates southern torrent salamander	CSC G3G4/S2S3	Inhabits cold, well-shaded, permanent streams and seepages, or within splash zone or on moss-covered rock within trickling water. Coastal redwood, Douglas-fir, mixed conifer, montane hardwood-conifer habitats.	**Not Present.** Suitable habitat does not occur within the CMA.

Reptile Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Emys (=*Clemmys*) *marmorata marmorata* northwestern pond turtle	CSC G3G4T3/S3	Ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. They need basking sites and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	**Moderate Potential.** Along the north coast of California, the Northwestern pond turtle is sparsely distributed, mainly at ponds in the interior. However, they are known to occur in semi-permanently inundated woody dune hollows in Manila and freshwater/riparian swamp within the CMA contains suitable habitat.

Bird Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Accipiter cooperi cooper's hawk (nesting*)	CSC G5/S3	Generally inhabits open, interrupted or marginal woodlands. Nest sites are primarily found in riparian growths of deciduous trees such as those found in canyon bottoms on river flood plains. They are also found in live oaks.	**Present.** Migrating and wintering birds use riparian and woodland habitats in around the CMA. Coniferous forest on site provides potential breeding habitat and breeding has been confirmed in the Ma-le'l area during the course of breeding bird survey efforts (Hunter et al. 2005).
Accipiter striatus sharp-shinned hawk (nesting*)	CSC G5/S3	Sharp-shinned hawk occupies Ponderosa pine, black oak, riparian deciduous, mixed conifer and Jeffrey pine habitats. North-facing slopes with plucking perches are critical requirements. Generally nests within 275 feet of water.	**High Potential.** While nesting sharp-shinned hawks are uncommon in the Humboldt Bay region they have been documented and banded in the summer at the adjacent Lanphere Dunes. Coniferous forest habitats within the CMA could potentially provide habitat for wintering or migrant birds.

Bird Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Ardea alba great egret (rookery**)	G5/S4	Great egret is a colonial nester in large trees. Rookery sites are located near marshes, tide flats, irrigated pastures and margins of rivers and lakes.	**Present.** A local resident and breeder, great egret is common in the Humboldt Bay region, including the CMA. The largest multi-species heron and egret rookery site in northwestern California is located within Humboldt Bay on Indian Island approximately 2.5 miles southeast of the CMA (Harris 1996, Hunter et al. 2005). Compared with other species breeding at the Indian Island rookery, great egret nests in the highest density.
Ardea herodias great blue heron (rookery**)	G5/S4	Great blue heron is a colonial nester in tall trees, cliffsides and sequestered locations on marshes. Rookery sites are located in close proximity to foraging areas: marshes, lake margins, tide flats, rivers, streams and wet meadows.	**Present.** A local resident and breeder, great blue heron is common in the Humboldt Bay region, including the CMA. The largest multi-species heron and egret rookery site in northwestern California is located within Humboldt Bay on Indian Island approximately 2.5 miles southeast of the CMA (Harris 1996, Hunter et al. 2005).
Asio flammeus short-eared owl (nesting*)	CSC G5/S3	Found in swamp lands, both fresh and salt, lowland meadows and irrigated alfalfa fields. Tule patches or tall grass are needed for nesting and daytime seclusion. Nests on dry ground in a depression concealed in vegetation.	**High Potential.** Short-eared owls are migrant and winter visitors and accidental breeders in northwestern California. Some of the salt marsh within the CMA provides suitable habitat for this species. They are known to occur in the Mad River Slough Wildlife Area just east of the Mad River Slough adjacent to the CMA, in the dunes and adjacent pasture in the Lanphere Dunes, at Eel River Wildlife a and tidelands of the Eel River estuary, at Centerville approximately 20 miles south of the CMA, Fay Slough approximately 4 miles southeast of the CMA (Harris 1996, Hunter et al. 2005) and were observed recently on the south spit of Humboldt Bay approximately 18 miles south of the CMA (S. McAllister, pers. obs.).

Bird Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Chaetura vauxi Vaux's swift (nesting*)	CSC G5/S3	Vaux's swift occurs in redwood, Douglas fir and other coniferous forests. Nesting is often in flocks and takes place in large hollow trees and snags. Vaux's Swift forages over most terrains and habitats but shows a preference for foraging over rivers and lakes.	**High Potential.** Coniferous forest and the riparian areas within the CMA serve as potential habitat for Vaux's swifts and they have been documented in riparian habitat at Lanphere, just north of the CMA (A. Pickart, pers. obs.).
Charadrius alexandrinus nivosus western snowy plover (nesting/coastal population***)	FT G4T3/S2	The federal listing applies only to the Pacific coastal population. Western snowy plover inhabits sandy beaches, salt pond levees and shores of large alkali lakes. In Northern California, breeding and wintering occurs along ocean beaches (including back dunes) and gravel bars of the Eel River (Colwell et al. 2002). Sand, gravelly or friable soils and sometimes driftwood above the mean high tide line are necessary for nesting (LeValley 1999).	**Moderate Potential.** Beach habitat along the North Spit of Humboldt Bay within and adjacent to the CMA does not appear to support snowy plovers. However, the back dunes of the CMA do provide suitable breeding habitat for plovers. Breeding season surveys of the North Spit, conducted approximately once monthly since 1997, have yielded negative results for snowy plover presence near the CMA. However, these monitoring efforts did not survey the backdunes of the CMA where plovers could breed. Additionally, the survey effort was inconsistent and not considered adequate to assume probable absence of plovers within the CMA.
Circus cyaneus northern harrier (nesting*)	CSC G5/S3	Northern harrier inhabits coastal salt and fresh-water marsh. Nesting and foraging take place in grasslands, from salt grass in desert sink to mountain cienagas. Nesting is on the ground in shrubby vegetation, usually at marsh edge. Nests are built of a large mound of sticks in wet areas.	**Present.** Northern harriers commonly winter and migrate through and uncommonly breed and summer in coastal marshes and grasslands around Humboldt Bay including within the CMA (Harris 1996, Hunter et al. 2005).

Bird Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Dendroica petechia brewsteri Yellow warbler (nesting*)	CSC G5T3?/S2	Yellow warbler occurs in conjunction with riparian-associated plants and prefers willows, cottonwoods, aspens, sycamores and alders for nesting and foraging. Nesting also occurs in montane shrubbery in open coniferous forests.	**Present.** Likely to occur within the willow dominated dune swales, freshwater/riparian swamps and potentially within the coniferous forest within the CMA during migration but not known to breed there (Hunter et al. 2005).
Egretta thula snowy egret (rookery**)	G5/S4	Snowy egret is a colonial nester with nest sited situated in protected beds of tense tules. Rookery sites are typically situated close to foraging areas such as marshes, tidal flats, streams wet meadows and borders of lakes.	**Present.** A local resident and breeder, snowy egret is common in the Humboldt Bay region, including the CMA. The largest multi-species heron and egret rookery site in northwestern California is located within Humboldt Bay on Indian Island approximately 2.5 miles southeast of the CMA (Harris 1996).
Elanus leucurus white-tailed kite (nesting*)	CFP G5/S3	White-tailed kite occurs in rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows or marshes are used for foraging close to isolated, dense-topped trees for nesting and perching.	**Present.** Common within the coastal lowland agricultural fields and wetland areas of the Mad River floodplain east of the CMA. White tailed kite is known to occur within the project area and breeding has been confirmed in breeding bird atlas survey blocks that include the CMA (Hunter et al. 2005).
Empidonax traillii willow flycatcher (nesting*)	SE G5/S1S2	Willow flycatcher inhabits extensive thickets of low, dense willows on the edges of wet meadows, ponds or backwaters at elevations between 2000 and 8000 feet. They require dense willow thickets for nesting and roosting. Low, exposed branches are used for singing posts and hunting perches.	**Moderate Potential.** Migrant willow flycatchers may be found in dune swales and limited willow habitats within the CMA. Willow flycatchers have been documented as migrants in the Lanphere dunes region. Although potentially suitable willow-dominated habitat is present; breeding within the CMA is unlikely as summering by willow flycatcher in Humboldt County is believed to be a rare and localized phenomenon and has not been reported from the project region (Hunter et al. 2005).

Bird Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Falco columbarius merlin (wintering****)	CSC G5/S3	Merlin inhabits the seacoast, tidal estuaries, open woodlands, savannahs, grassland edges, deserts and farm and ranch lands. Clumps of trees or windbreaks are required for roosting in open country.	**Present.** In northwestern California, merlin is an uncommon migrant and winter visitor and appears each fall in the open lowlands along the coast such as those present within and adjacent to the CMA (Harris 1996, Hunter et al. 2005).
Falco peregrinus peregrine falcon (nesting*)	CFP G4T3/S2	Peregrine falcon occurs near wetlands, lakes, rivers or other water on cliffs, banks, dunes, mounds and human-made structures. Nests consist of a scrape on a depression or ledge in an open site.	**Present.** Suitable coastal lowland habitats supporting shorebirds and other waterbirds upon which peregrine falcons feed are present within the CMA. Peregrines also forage in Humboldt Bay east of the CMA. Nesting has been suspected, but not confirmed at the Samoa Bridge approximately 3 miles southeast of the CMA.
Haliaeetus leucocephalus bald eagle (nesting* & wintering****)	FT, SE CFP G5/S2	Bald eagle inhabits the ocean shore, lake margins and rivers for both nesting and wintering. Most nests are within 1 mile of water. Nesting takes place in large old growth or dominant live trees with open branches, especially Ponderosa pine. Bald eagle roosts communally in winter.	**Low Potential.** Bald eagle nesting habitat does not occur within the CMA although during winter occasional bald eagles forage along the margins of Humboldt Bay near the CMA
Numenius americanus long-billed curlew (nesting*)	CSC G5/S2	Long-billed curlew breeds in upland short grass prairies and wet meadows in northeastern California. Habitats on gravelly soils and gently rolling terrain are favored over others.	**Moderate Potential.** Long-billed curlew is present in Humboldt Bay near the CMA during winter and migration periods. Long-billed curlews use the beach habitat in the Lanphere Dunes, north of the CMA, while foraging.

Bird Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Nycitcorax nycticorax black-crowned night-heron (rookery**)	G5/S3	Black-crowned night heron is a colonial nester, usually in trees, occasionally in tule patches. Rookery sites are located adjacent to foraging areas: lake margins, mud-bordered bays and marshy locations.	**Present.** Black-crowned night heron is a common local resident and breeder in coastal lowlands (Harris 1996). It is known to breed and roost at a number of sites within lowlands of the Mad River and around Humboldt Bay, likely including sites within the CMA. Breeding is also known to occur within the multi-species heron and egret rookery on Indian Island approximately 2.5 miles southeast of the CMA (Harris 1996).
Pandion haliaetus osprey (nesting*)	CSC G5/S3	Osprey occurs along the ocean shore, bays, freshwater lakes and larger streams. Large nests are built in tree tops within 15 miles of a good fish-producing body of water.	**Present.** Ospreys forage in the ocean adjacent to the CMA and in Humboldt Bay. An active osprey nest is known from Ma-le'l North and is located atop a snag within freshwater/riparian swamp. The nest is visible from the Ma-le'l North parking lot and is immediately adjacent (within 50m) to the railroad berm trail and both the existing and proposed wetland view decks.
Poecile atricapilla black-capped chickadee	CSC G5T2T3/S1	Black-capped chickadee inhabits riparian woodlands in Del Norte and northern Humboldt counties. The species is primarily found in deciduous tree types, especially willows and alders, along large or small watercourses.	**Present.** Occurs throughout the CMA in coniferous forest, woody dune swales, freshwater/riparian marsh and thickets. Also likely in adjacent suburban habitats.
Pelecanus occidentalis californicus California brown pelican (nesting* colony)	FE, SE, CFP G4T3/S2?	California brown pelican is a colonial nester on coastal islands just outside the surf line. Nesting occurs on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators.	**Present.** Brown pelican uses the near-shore Pacific Ocean west of the CMA and may occasionally use the beach and coastal promontories for day-roost sites. Pelicans also use Humboldt Bay east of the CMA extensively for foraging, loafing and roosting habitat. No nesting sites are known north of Monterey Bay.

Bird Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Phalacrocorax auritus double-crested cormorant (rookery** site)	CSC G5/S3	Double-crested cormorant is a colonial nester on coastal cliffs, offshore islands and along lake margins in the interior of the state. The species nests along the coast on sequestered islets, usually on ground with a sloping surface or in tall trees along lake margins.	**Present.** Present locally year-round, double-crested Cormorant breeds on pilings in Humboldt Bay near the Old Arcata Wharf, approximately 3 miles southeast of the CMA, forage in Humboldt Bay and also in the ocean adjacent to CMA, and roost on pilings along the bay shore.
Progne subis purple martin (nesting*)	CSC G5/S3	Purple martin inhabits woodlands, low elevation coniferous forest of Douglas fir, Ponderosa pine and Monterey pine. Nesting occurs primarily in old woodpecker cavities mostly but can also take place within human-made structures. Nests are often located in tall, isolated trees and snags.	**High Potential.** Suitable habitat for purple martins is present in and around the CMA. Breeding could occur but has not been documented, and in Humboldt County appears to be somewhat removed from the immediate coast (Hunter et al. 2005). However, purple martins have been documented in the forest habitat in the adjacent Lanphere Dunes.
Rallus longirostris levipes California clapper rail	FE, SE, CSC G5T1/S1	California clapper rail inhabits salt water and brackish marshes traversed by tidal sloughs in the vicinity of the San Francisco Bay. This species is associated with abundant growths of pickleweed but feeds away from cover on invertebrates from mud-bottomed sloughs.	**Not Present.** Although this species reportedly formerly occurred at Humboldt Bay (known from 1 old specimen), and other California sites, it is not expected to occur in northwestern California at present (Harris 1996, Hunter et al. 2005). An unverified nesting report exists from Mad River Slough (Burton 1972 *in* Hunter et al. 2005).
Riparia riparia bank swallow (nesting*)	ST G5/S2S3	Bank swallow is a colonial nester, nesting primarily in riparian and other lowland habitats west of the desert. Vertical banks or cliffs with fine textured, sandy soils to dig a nesting hole near streams, rivers, lakes or the ocean are required.	**Low Potential.** No breeding habitat for bank swallows is present in or near the CMA Although rare migrants could potentially use the area for foraging and a vagrant has been reported from the adjacent Lanphere Dunes.

Bird Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Sterna elegans elegant tern (nesting* colony)	CSC G2/S1	There are only 3 known breeding colonies of elegant tern: San Diego Bay, Los Angeles Harbor and Bolsa Chica Ecological Reserve. Elegant tern nests on open, sandy, undisturbed beaches and on salt-evaporating pond dikes (San Diego) in association with Caspian tern.	**High Potential.** Elegant tern is a fall visitor to northwestern California and frequents the bay shore along the North Spit of Humboldt Bay including the CMA. Nesting is highly unlikely.

Mammal Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Arborimus albipes white-footed vole	CSC G3G4/S2S3	White-footed vole inhabits mature coastal forests in Humboldt and Del Norte counties. Areas near small, clear streams with dense alders and shrubs are preferred. White-footed vole occupies the habitat from the ground surface to the canopy and feeds in all layers. Nesting takes place on the ground under logs or rocks.	**Present.** White-footed vole is known from the project vicinity. A CNDDB occurrence record exists for an area west of the Mad River Slough, approximately 2.5 miles south-southwest of Tyee City. This occurrence is just north of the CMA in beach pine forest.
Arborimus pomo Sonoma tree vole	FSC, CSC G3/S3	Sonoma tree vole occurs along the north coast fog belt from Oregon border to Sonoma County in Douglas fir, redwood and montane hardwood-conifer forests. The species feeds almost exclusively on Douglas fir needs but will occasionally take needles of grand fir, hemlock or spruce.	**Low Potential.** Although red tree vole is known from coastal sites, sufficient suitable Douglas fir habitat is unlikely within the CMA.
Martes americana humboldtensis	CSC G5T2T3/S2	Occurs only in the coastal redwood zone from the Oregon border south to Sonoma County associated with late-successional coniferous	**Not Present.** Suitable habitat for Humboldt marten does not occur within the CMA.

Mammal Species	Status*	Habitat Characteristics	Potential for Occurrence at the CMA
Humboldt marten	S3	forests. Forests with low overhead cover are preferred.	
Myotis evotis Long-eared myotis	G5/S4?	Found in all brush, woodland and forest habitats from sea level to about 9000 feet. Prefers coniferous woodlands and forests. Nursery colonies are typically in buildings, crevices, spaces under bark. Snags and caves are used primarily as night roosts.	**Not Present.** Suitable habitat for Humboldt marten does not occur within the CMA.

Note: This list was compiled from a search of the Eureka, Arcata North, Arcata South, Tyee City, Fields Landing, Cannibal Island, and McWhinney Creek 7.5 minute USGS quadrangles of the California Department of Fish and Game Natural Diversity Data Base (CNDDB 2006) and California Native Plant Society on-line inventory (CNPS 2006), and an assessment of the habitats present within the CMA by Mad River Biologists.

Key to status codes:

CFP: CDFG Fully Protected Animal
CLS: California Lichen Society "Red List"
CSC: CDFG Species of Special Concern
FSC: Federal Species of Concern
SE: State Endangered
ST: State Threatened
FE: Federal Endangered
FT: Federal Threatened

* Listing refers only to the nesting population.
** Listing applies only to rookery sites.
*** Listing applies only to the coastal breeding population.
**** Listing applies only to the wintering population.

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Threatened, Endangered and Special Status Plants

The following discussion of threatened, endangered and special status plants is based on information provided by CMA resource managers from the BLM (Ma-le'l South) and the USFWS (Ma-le'l North), and occurrence records inventoried in the California Natural Diversity Database (CNDDB 2006) and California Native Plant Society On-line Inventory of Rare, Threatened and Endangered Plants of California (CNPS 2006). The locations of special status plants documented within the CMA are illustrated in Figure 6. Figure 7 illustrates federally listed plant species within the CMA.

Two federal and state-listed endangered plants are known to occur within the nearshore dunes of the CMA, Humboldt Bay wallflower (*Eryisimum menziesii* spp. *eurekense*) and beach layia (*Layia carnosa*). Detailed information regarding the distribution and size of the wallflower and beach layia colonies located within the CMA in respect to their range wide distribution and population size is provided in the Biological Assessment for the Ma-le'l Dunes Cooperative Management Area Public Access Plan (Appendix A), and summarized below. Other special status plants known to occur within the nearshore dunes of the CMA include pink sand verbena (*Abronia umbellata* ssp. *breviflora*), dark-eyed gilia (*Gilia millefoliata*), and American glehnia (*Glehnia littoralis* ssp. *leiocarpa*). Estuarine habitats (salt and brackish marsh) associated with the Mad River Slough are known to support Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. *humboldtiensis*), Point Reyes bird's-beak (*Cordylanthus maritimus* ssp. *palustris*), Lyngbye's sedge (*Carex lyngbyei*) and sea watch (*Angelica lucida*).

No other threatened, endangered or special status plants are presently known to occur within the CMA; however consideration is given to a number of non-listed, but locally rare plants that warrant recognition and protection under the proposed public access plan.

Humboldt Bay wallflower (*Erysimum menziesii* ssp. *eurekense*) was listed as endangered under the Federal ESA in March of 1992, and is included in the 1998 Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly (USFWS 1998). It is one of four subspecies of Menzies' wallflower (*Erysimum menziesii*), three of which are federally recognized as endangered with a collective distribution over three coastal dune systems in Humboldt, Mendocino, and Monterey counties. Humboldt Bay wallflower is a local endemic, restricted to the nearshore dunes around Humboldt Bay where it grows primarily on the flanks and crests of dunes ridges in the dune mat community. The wallflower is also known to occur in suboptimal habitats such as open sandy areas and on the borders of lupine scrub and herbaceous swales. It is not usually found growing in dense vegetation where invasive species are dominant.

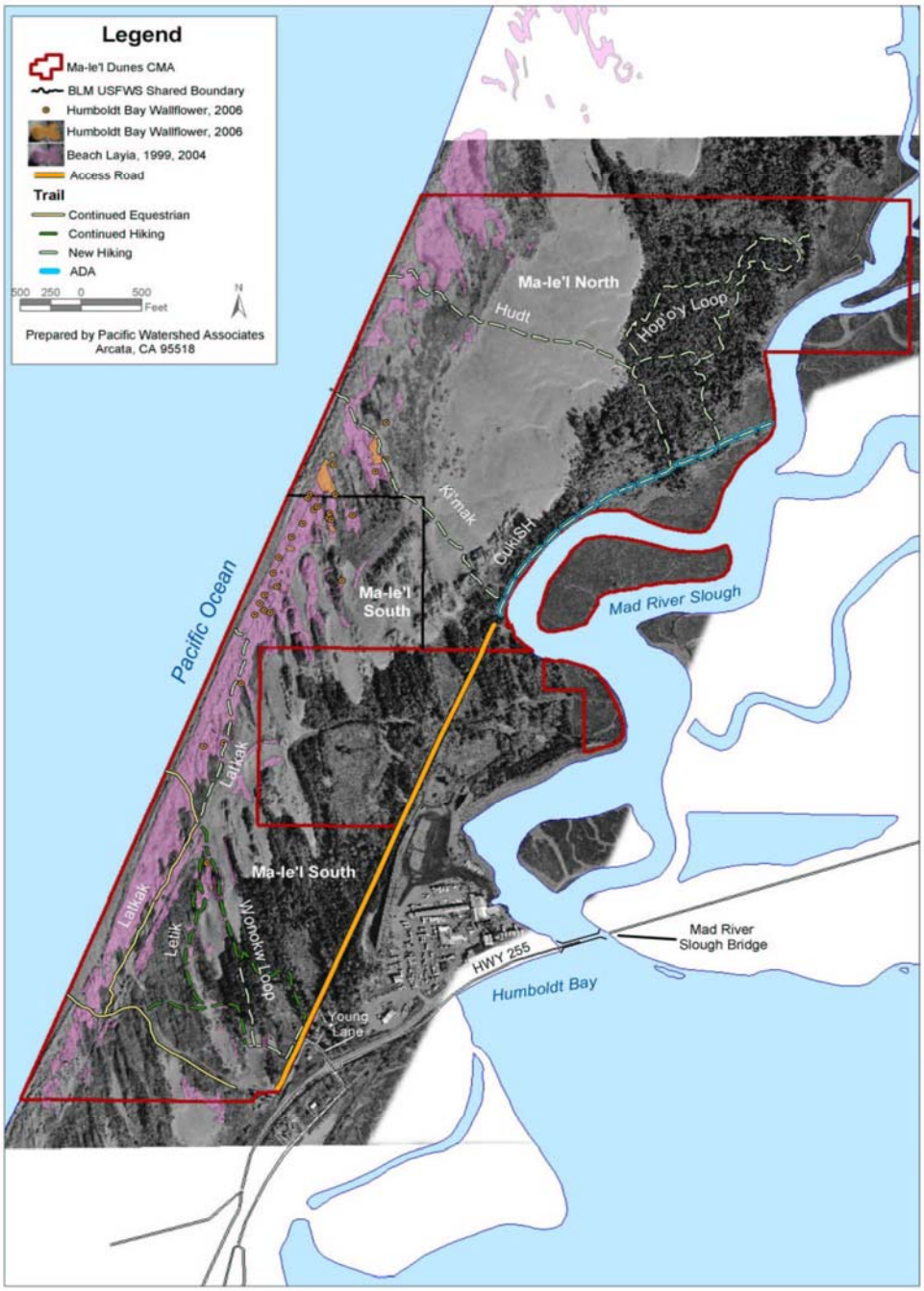

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Figure 7. Federally Listed Plant Species of the Ma-le'l Dunes CMA

Humboldt Bay Wallflower is a member of the mustard family (Brassicaceae). Its life history is that of a semelparous (monocarpic) perennial, meaning that it flowers and produces fruit only once during its life, after which, it dies. The wallflower forms a basal rosette of leaves that may persist for up to eight years before flowering. Blooming typically occurs from March through April, although it may begin as early as late February. The fruits mature by mid-June. The seeds remain attached to the fruit walls after dehiscence, and disperse over a long period, primarily in conjunction with winter storm events that dislodge the mature inflorescences and scatter them by way of a tumbling action (Pickart and Sawyer 1998). Fecundity is high, with individual plants producing numerous seed; however, the wallflower does not have a persistent seed bank (Carothers 1996) and seedling survivorship is low, with 98.3% mortality shown to occur in the first year (Pickart and Sawyer 1998).). Reproduction may also be hindered by infestation of *Albugo canadensis*, an endemic fungal pathogen that causes white rust disease in the local subspecies. Disease symptoms are more prevalent on reproductive individuals, where they can decrease fecundity by reducing seed number or viability (Pickart & Sawyer 1998).

A primary threat to Humboldt Bay wallflower at the Ma'le-l Dunes CMA is displacement from invasive non-native species, particularly European beachgrass, yellow bush lupine, ice plant, and jubata grass (*Cortaderia jubata*). Management strategies for the recovery of the wallflower have focused primarily on control and eradication of these species. Other conceivable threats to the wallflower within the Ma'le-l Dunes CMA include actions that cause habitat degradation and destruction or mortality of individual plants, such as facility development, vehicle trespass, episodic and high intensity use by pedestrians or horses, and wildlife predation and disease (USDI-BLM 2004b).

Population and Distribution

The Recovery Plan written in 1998 described six extant occurrences of Humboldt Bay wallflower, with an estimated population size of 18,800 individuals occupying approximately 2,235.7 acres. More than 98% of the population occurred on the North Spit on public property managed by the USFWS or the BLM, and were therefore afforded protection under the federal ESA (USUSFWS 1998). The South Spit colony occurring on private land owned by Texaco was reported to have 178 plants in 1991 and only 75 plants in 1998 (USUSFWS 1998).

More recent survey efforts place the population size higher than estimates reported in the Recovery Plan. In 1989, Andre and Sawyer sampled wallflowers larger than 3 cm (1.2 in) in diameter on the North Spit, and estimated the population at 20,657 plants ± 2,344 (95% confidence intervals) (Pickart & Sawyer 1998). Nine years later (1998), the Nature Conservancy re-sampled the North Spit population using the same methods and found that the population had increased to 29,657 (±5,263), but noted that the increase was not consistent among all North Spit colonies, some of which had declined (Pickart & Sawyer 1998). The North Spit has had a considerable amount of restoration work and invasive plant removal since 1988, which is thought to be correlated to the increase in wallflowers.

Also in 1998, a previously undocumented colony of wallflower was discovered on the Elk River Spit, a census conducted in 2000 revealed a population total of 3,782 plants

over 2 cm in diameter, of which 13% were reproductive; and a total of 6,066 plants < 2 cm in diameter (USUSFWS unpublished data). In 2002, the USFWS re-surveyed the South Spit colony and found a total of 133 individuals (excluding small rosettes less than 2 cm in diameter), of which 32 percent were reproductive. By 2006, the South Spit colony had increased to 457 plants (excluding small rosettes) of which 33 percent were reproductive (Clifford 2006). This increase is attributed to the caging of flowering individuals, which were being grazed by deer.

Population and Distribution within Action Area

In 2006, the USFWS completed a third population-wide survey for Humboldt Bay wallflower; however, population size data will not be available before completion of the Ma-le'l Dunes Coastal Access Plan Biological Assessment. The current (2006) distribution of the wallflower was provided and mapped for the CMA as shown in Figure 4. Preliminary observations indicate that the population has increased in range and probably in size (pers. comm. Andrea Pickart).

Between 2003 and 2005, the Center for Natural Lands Management (CNLM) served as a liaison for the acquisition and transfer of the Fernstrom-Root parcel and the two former Khoaghali and Buggy Club parcels from private ownership to the USFWS and the BLM. In 2004, CNLM surveyed and mapped the population of Humboldt Bay wallflower within what is now referred to as Ma-le'l North. CNLM estimated the population within two macroplots (representing close to the total population) at 1,040 wallflowers with a 95% confidence interval of ± 297 individuals (USUSFWS unpublished data *in* EDAW 2005).

The BLM reports that in 1997 the 112-acre Manila Dunes ACEC had approximately 500 individuals of wallflower with a standard error of about 55 (USDI-BLM 2004b). Most of the wallflower was found in the north half of the property, and no wallflower has been seen within BLM's newly acquired, 42-acre parcel Khoaghali parcel as of 2006. Based on the 1997 population-wide survey, the wallflower at the Ma-le'l Dunes CMA (using the most recently available sampling data from CNLM, BLM, and USFWS) represents approximately 5.1% of the entire population of Humboldt Bay wallflower, and 5.2% of the North Spit population.

Beach layia (*Layia carnosa*) was listed as endangered under the federal ESA in March of 1992, and is included in the 1998 Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly (USUSFWS 1998). This species is found in coastal dune systems from Vandenberg Air Force Base in Santa Barbara County north to Freshwater Lagoon in Humboldt County (CNDDB 2006). It occurs in greatest abundance in Humboldt County, and in particular, on the North Spit of Humboldt Bay (USUSFWS 1998).

In the Humboldt Bay dunes, beach layia is found primarily on foredunes in the dune mat community. It occurs in lower densities along margins of lupine scrub, herbaceous hollows, and open areas with moving sand. It is also known to tolerate disturbed and gravelly soils along roadsides, vehicle trails and footpaths (Duebendorfer 1992). Beach layia readily colonizes newly created bare sand areas, and is resilient to disturbance, however, it does not tolerate competition with other plants and does not establish in areas where there is high cover of native or non-native plants.

Beach layia is an annual herb that belongs to the sunflower family (Asteraceae). It germinates in mid-winter during the rainy season and typically blooms from March to May, completing its life cycle by late spring. Seeds are dispersed mostly by wind in late spring and summer. The number of seed-heads produced by individual plants varies in relation to plant size. Short, unbranched, erect plants growing on dry, exposed sites may produce only a single head, whereas taller, highly branched individuals found in moist dune swales may produce as many as 100 seed heads (USUSFWS 1998).

Loss of habitat due to coastal development, encroachment of non-native plant species, and trampling by vehicles and pedestrians are all factors that contribute to the decline in numbers of this species. Beach layia is most susceptible to trampling effects during its growing season from mid-winter to late spring. However, a certain amount of disturbance during the off season may favor beach layia by opening up areas for colonization (Botanica Northwest Associates 1992).

Distribution and Population Size

Beach layia is currently known from approximately 20 occurrences over eight dune systems (representing approximately 1,390 acres) between Humboldt County and Santa Barbara County. The largest population reportedly occurs on the North Spit of Humboldt Bay. Five historical occurrences in San Francisco, Monterey, and Humboldt counties are believed to have been extirpated (USUSFWS 1998). The population distribution of beach layia does not lend itself well to the CNDDB definition of "occurrences." There is a disjunct occurrence at Freshwater Lagoon (Redwood National Park; less than one acre). Beach layia then occurs in a patchy fashion along a semi-continuous corridor from Mad River Park south to the Samoa Dunes Recreation Area, on a combination of private, NGO, local, state, and federal government properties. Populations continue along the South Spit (BLM managed), Eel River Wildlife Area (Department of Fish and Game), and the vicinity of McNutt Gulch and the mouth of the Mattole River (private and BLM).

The following distributional information for Marin, San Francisco, Monterey, and Santa Barbara counties is taken from the Recovery Plan, dating from the 1990s (no updated information is available (USUSFWS 1998): The Marin County occurrences are located in the dunes between Kehoe Beach Dunes and Point Reyes lighthouse at Point Reyes National Seashore. Surveys by California Native Plant Society (CNPS) volunteers have recorded thirteen colonies along the dune complex at Point Reyes. An occurrence in Golden Gate Park on the San Francisco Peninsula has been extirpated since 1904. The Monterey Peninsula dune system had four occurrences, although the Point Pinos site is thought to have been extirpated. After it had been reported as extirpated, an occurrence at Asilomar State Beach was rediscovered following the removal of iceplant. Additional occurrences have been discovered on neighboring private property. Two beach layia occurrences exist on north Spyglass Hill and on the nearby Spyglass Hill dunes. In April 1995, David Keil rediscovered a small occurrence (80 plants) of beach layia on Vandenberg Air Force Base, Santa Barbara County. During a subsequent visit to the site an additional 200 individuals were discovered closer to the ocean bluffs.

The total range wide population size of beach layia is estimated in the Recovery Plan at 300,000 individuals. This estimate was acquired mostly from informal estimates of populations made across the range prior to 1998, and it did not include an estimated

19,400 plants documented in 1993 from the Eel River Wildlife Area, or the population at the Lanphere Dunes that had been estimated at +/- one million. The historical data is considered of limited value due to large annual fluctuations in both population size and local distribution, and the frequent underestimation of population size in small annual species such as beach layia.

A 1992 pilot study of field sampling methods conducted by Botanica Northwest found an estimated 2.5 million individuals ± 750,000 on the North Spit (Botanica Northwest Associates 1992). The 2005 sample of beach layia at the Lanphere Dunes Unit estimated at total of 1.5 million plants +/- 320,000 (USUSFWS unpublished data). A statistical protocol was also implemented by the BLM and USFWS in May 2003 to estimate the beach layia population on the South Spit of Humboldt Bay. That data has not yet been fully analyzed, but preliminary analysis suggests the total South Spit population may exceed 5 million plants (unpublished data on file, BLM Arcata), further suggesting that the summary of occurrence data in the Recovery Plan may grossly underestimate the true range wide population of beach layia. Redwood National Park personnel estimated the beach layia population at Freshwater Spit in 2003 at just over 11,000 plants (Redwood National Park 2003 in USUSFWS) Based on these estimates, the total number of beach layia occurring around Humboldt Bay and Redwood National Park likely exceeds 5 to 6 million. Population estimates for sites located south of Humboldt County are not available.

Population and Distribution within Action Area

Beach layia was surveyed and mapped by CNLM in May 2004 at Ma-le'l North, where it was found to occupy approximately 6.4-acres (Figure 4). Density was estimated at 3.8 individuals/m^2 ± 1.3 (95% confidence interval) by sampling a single, 0.6-acre macroplot (USUSFWS unpublished data *in* EDAW 2004). The BLM reports that beach layia is abundant throughout the dunes of Ma-le'l South, and is increasing where invasive weed eradication efforts have occurred. Completion of invasive weed eradication over the nearshore dunes of the newly acquired, 42-acre former Khoaghali parcel is expected to boost beach layia density and distribution on about 10 acres (USDI-BLM 2004b). Ongoing restoration at Ma-le'l North is also expected to result in increased population of beach layia at that site.

Pink sand verbena (*Abronia umbellata* ssp. *breviflora*) is on List 1B of the CNPS inventory as endangered in a portion of its range, endemic to California, and distributed in a limited number of occurrences. Currently, pink sand verbena is not listed as endangered by the State of California or the federal government. Threats to this species include stabilization of the sand dunes by European beachgrass and other non-native species, loss of habitat to development, and vehicle disturbance.

Pink sand verbena is a member of the four-o'clock family (Nyctaginaceae). It is an annual or a short-lived perennial that forms a small taproot; it has been suggested that it may exhibit different growth strategies under different environmental conditions (Roberts 1994). Pink sand verbena blooms July through September (CNPS 2006). It is morphologically similar to a closely related species, yellow sand verbena (*Abronia latifolia*), which is abundant on the North Spit. Unlike pink sand verbena, yellow sand verbena is a long-lived perennial that forms an extensive root system with a large taproot

and many lateral roots. The preferred habitat for pink sand verbena is dune mat and the upper beach, but it also occurs on open sandy bay edges, and river mouths. Associated species include yellow sand verbena (*Abrona latifolia*), beach pea (*Lathyrus littoralis*), dunegrass (*Leymus mollis*), European beachgrass (*Ammophila arenaria*), sea rocket (*Cakile maritima*) and beach bursage (*Ambrosia chamissonis*) (Vrilakas 1988).

The nearshore dunes of Ma-le'l South and Ma-le'l North provide suitable habitat for this species, although currently it is only known from two small occurrences west of the proposed Latkak Trail in Ma-le'l South (Figure 6).

Dark-eyed gilia (*Gilia millefoliata*) is on List 1B of the CNPS inventory as endangered in a portion of its range, rare outside California, and distributed in a limited number of occurrences. Currently, dark-eyed gilia is not listed as endangered by the State of California or the federal government. It occurs from southern Oregon to Marin County in California. Threats to this species include stabilization of the sand dunes by European beachgrass and other non-native species, loss of habitat to development, grazing, and vehicle and foot traffic.

Dark-eyed gilia is a member of the phlox family (Polemoniaceae). It is an annual herb that typically blooms between April and July (CNPS 2006). It is a small (less than 30 cm tall), densely glandular plant with a "skunk-like odor" (Hickman 1993) that forms a basal rosette of 1-2-pinnately lobed leaves. It produces clusters of two to six small flowers in the axils of bracts. It is described in the CNDDB (2006) as occurring in coastal habitats between 0 and 32 feet in elevation. Native associates include dune mat species such as yellow sand verbena, beach pea, beach layia, dune knotweed (*Polygonum paronychia*) and seashore bluegrass.

Dark-eyed gilia has been documented in the nearshore dunes at Ma-le'l South by the BLM. It has been documented but not mapped at Ma-le'l North.

American Glehnia (*Glehnia littoralis* ssp. *leiocarpa*) is a CNPS list 4 species. Plants on this list are of limited distribution or infrequent throughout a broader area in California. They are not currently considered endangered or "rare" but they are uncommon enough that monitoring is warranted. This species is known to occur from Mendocino County in California north into Washington on coastal dunes. Like many of the other sensitive dune plants, threats to this species include stabilization of the sand dunes by European beachgrass and other non-native species, loss of habitat to development, grazing, and vehicle and foot traffic.

American glehnia is a perennial herb of the Carrot Family (Apiaceae). It is a low growing, prostrate plant with fleshy, divided (1-2- ternate or ternate-pinnate) leaves. It blooms between May and August, producing a stout, compound umbel of small white flowers.

Occurrences of American glehnia within the CMA have been documented but not mapped. Suitable habitat includes the nearshore dunes of the CMA. Two individuals were identified at Ma-le'l North in the spring of 2006 during a site visit to the CMA (pers. obs. S. Morrissette, Mad River Biologists). Additionally, it grows extensively on the Fernstrom Root parcel (pers. comm. Andrea Pickart 9/7/06).

Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. *humboldtiensis*) is a CNPS List 1B species. It is endemic to California and considered endangered in a portion of its range and of limited distribution. Habitat for this species has been much reduced due to coastal development. Threats to this species are largely from coastal development; locally this pertains to the loss of salt marsh habitat over the last century from the reclamation of approximately 85% of the historic tidelands within Humboldt Bay for agriculture, as well as urban and residential development (Eicher 1987, Shapiro and Associates 1980). Other threats include encroachment of non-native plants, foot traffic and cattle grazing and trampling.

Humboldt Bay owl's-clover is an annual, herbaceous member of the figwort family (Scrophulariaceae). It is considered a hemiparasite, which refers to its ability to parasitize other plant species by means of haustoria that are essentially modified roots capable of penetrating and absorbing material from host plant tissue. Optimal habitat for this species is the high salt marsh habitat at elevations between 7.7 -8.4 feet MLLW (Eicher 1987). It occurs locally on island and mainland salt marshes around Humboldt Bay, from the mouth of the Eel River to the mouth of the Mad River (Newton 1985). Specific habitat for Humboldt Bay owl's-clover is the mixed marsh subtype of salt marsh described by Eicher (1987). The mixed marsh habitat is considered the most diverse marsh type in Humboldt Bay in terms of total number of species. It generally grows in open areas within low-growing vegetation such as pickleweed (*Salicornia virginica*), jaumea (*Jaumea carnosa*), saltgrass (*Distichlis spicata*), sea lavender (*Limonium californicum*), and arrowgrass (*Triglochin maritima* and *T. concinna*). Locally, Humboldt Bay owl's-clover reaches its peak blooming period between May and mid-June, and then withers rapidly after setting seed, generally from mid June to early July.

Humboldt Bay owl's-clover occurs on mainland and island salt marsh habitats of the Mad River Slough. On the mainland of the CMA, the owl's-clover grows in the salt marsh at the end of the railroad berm trail in the vicinity of the proposed boat landing at Ma-le'l North.

Point Reyes bird's-beak (*Cordylanthus palustris* ssp. *martimus*) is also a CNPS List 1B species of limited distribution, and is considered rare outside of California. Like Humboldt Bay owl's-clover, Point Reyes bird's-beak is an annual, hemiparisitic species of the figwort family that grows in high salt marsh habitats. It has a wider geographic range than the owl's-clover, occurring from Morro Bay, California to Coos Bay, Oregon. It is often found growing in association with Humboldt Bay owl's-clover, however Point Reyes bird's-beak is more common at slightly lower elevations (7.2-7.7 MLLW) (Eicher 1987). Locally, the peak blooming period for Point Reyes bird's-beak is mid-June through July.

Like Humboldt Bay owl's-clover, Point Reyes bird's-beak also occurs on mainland and island salt marsh habitats of the Mad River Slough where the two often overlap. The majority of the bird's-beak within the CMA is found on island marshes, but small occurrences have been mapped on the mainland at Ma-le'l North.

Lyngbye's sedge (*Carex lyngbyei*) is a clonal, halophytic (salt tolerant), perennial sedge of the carex family (Cyperaceae). Its historical distribution is Iceland and the North Pacific coasts of America and Asia (Cayouette 1986). Mason (1957) describes its

distribution in California as in marshes near the coast in Marin, Mendocino, and Humboldt Counties. It is a CNPS list 2.2 species, and is considered fairly endangered in California but more common elsewhere. Lyngbye's sedge is the dominant sedge in coastal brackish marshes in Oregon, Washington and Alaska.

Occurrences of Lyngbye's sedge within the Mad River Slough have not been mapped by USFWS or the BLM, however this species was observed growing along the west bank of the slough north of the parking area at Ma-le'l North during field visits to the CMA in 2005 and 2006 (pers. obs. S. Morrissette).

Sea watch (*Angelica lucida*) is a perennial herb of the carrot family (Apiaceae). It is a CNPS list 4 species with limited distribution that is considered fairly endangered in California. In California, it is known from Humboldt, Del Norte and Mendocino counties where is occurs in coastal bluff scrub, coastal dunes, coastal scrub, and coastal salt and brackish marshes at elevations between 0 and 150 meters.

Occurrences of sea watch have not been mapped within the CMA, but the species reportedly occurs with the brackish marsh habitats at Ma-le'l North (pers. comm. Andrea Pickart October 2006).

Other Locally Rare Plants

The Humboldt Bay National Wildlife Refuge Ecologist has identified a number of locally rare plants within the CMA that warrant consideration for the proposed access plan. Most of these represent herbaceous species that occur in the understory of the coniferous forest. This habitat is host to several species of orchids, as well as fungi, lichens and bryophytes. A locally uncommon occurrence of American vetch (*Vicia Americana*) occurs near the proposed Railroad berm trail along the railroad berm, and the native spear oracle (*Atriplex patula*) is known to occur within the salt marsh habitat at Ma-le'l North (pers. comm. Andrea Pickart 2006). The protection of these species and their associated habitats will be considered during implementation of the Ma-le'l Dunes Public Access Plan.

Endangered, Threatened and Special Status Animals

The following discussion of threatened, endangered and special status animals is based on information provided by CMA resource managers from the BLM (Ma-le'l South) and the USFWS (Ma-le'l North), occurrence records inventoried in the California Natural Diversity Database (CNDDB 2006), and an independent assessment of the habitat within the CMA by Mad River Biologists. A total of 34 wildlife species have known or potential occurrence within the CMA, as discussed in the following section:

Fish

Tidewater goby (*Eucuclogobius newberryi*) is federally listed as Endangered and is a California Species of Special Concern. Tidewater goby occurs in brackish water along the coast of California from Agua hedionda Lagoon, San Diego County to the mouth of the Smith River. Locally, tidewater goby is known from Humboldt Bay, including near the Mad River Slough and could occur within other sloughs associated with the bay (CNDDB 2006). The primary threat to this species is degradation of coastal lagoons

through diversion of their freshwater supplies, pollution, siltation, bridge construction, and urban development of surrounding lands, and to invasion by non-native species of fish and frogs, which are potential predators of tidewater gobies.

Tidewater goby has a high potential for occurrence within the portion of the Mad River Slough that meanders through the eastern edge of the CMA.

Coast cutthroat trout (*Oncorhynchus clarki clarki*) is a California Species of Special Concern and occurs in small, low gradient coastal streams and estuaries from the Eel River in Humboldt County, California to the Oregon border. The greatest threat to this species is habitat alteration and destruction, particularly for the developing embryos and fry in small streams. The most significant cause of habitat loss is logging and its negative effects on stream environments, including increased temperatures, loss of cover, areduction in food supply and increased turbidity.

Coast cutthroat trout are known to occur in Humboldt Bay which is contiguous with the Mad River slough adjoining the CMA where they have a high potential for occurrence.

Coho salmon – southern Oregon/northern California ESU (*Oncorhynchus kisutch*) is both federally and state-listed as threatened. The federal listing refers to populations between Cape Blanco, Oregon and Punta Gorda, Humboldt County, California and the state listing refers to populations between the Oregon border and Punta Gorda, California (CNDDB 2006). Threats to this species include poor land-use practices that degrade streams, especially those related to logging and urbanization; the exacerbating effects of floods and drought; the breakdown of the genetic integrity of wild stocks through planting of hatchery fish; introduced diseases; over harvesting; and climatic change.

Coho salmon are known to occur in Humboldt Bay which is contiguous with the Mad River Slough adjoining the CMA where they have a high potential for occurrence. The CMA also falls within critical habitat for the southern Oregon/northern California ESU (Rick Rogers, NOAA Fisheries, pers. comm.).

Steelhead – northern California ESU (*Oncorhynchus mykiss irideus*) is federally listed as threatened. Steelhead of the northern California ESU include naturally spawned populations residing below impassable barriers in coastal basins from Redwood Creek, Humboldt County, south to the Gualala River, Mendocino County. The listing does not include summer-run steelhead (CNDDB 2006). Threats to this species include habitat loss and degradation.

Coho salmon are known to occur in Humboldt Bay, which is contiguous with the Mad River Slough adjoining the CMA where they have a high potential for occurrence. The CMA also falls within critical habitat for the southern northern California ESU (Rick Rogers, NOAA Fisheries, pers. comm.)

Chinook salmon – California coastal ESU (*Oncorhynchus tshawytscha*) is federally listed as threatened. Chinook Salmon of the California coastal ESU includes wild spawned, coastal, spring and fall runs between Redwood Creek, Humboldt County and the Russian River, Sonoma County (CNDDB 2006). Threats include habitat loss and degradation.

Chinook salmon are known to occur in Humboldt Bay which is contiguous with the Mad River Slough adjoining the CMA where they have a high potential for occurrence. The

CMA also falls within critical habitat for the California coastal ESU (Rick Rogers, NOAA Fisheries, pers. comm.)

Amphibians and Reptiles

Northern red-legged frog (*Rana aurora aurora*) is a California Species of Special Concern and ranges from northern Humboldt County, California to Sullivan Bay, British Columbia (Jennings and Hayes 1994). In California, the northern red-legged frog and populations intermediate between northern and California red-legged frogs extend from Marin County north to the Oregon state line with an elevational range from near sea level to 300 meters (CNDDB 2006). Threats to this species include urban encroachment, construction of reservoirs and water diversions, land conversions, industrial and non-industrial forest practices, introduction of exotic predators and competitors, livestock grazing, and habitat fragmentation.

Northern red-legged frogs are likely to occur in dune swales and riparian/freshwater swamp within the CMA.

Northwestern Pond Turtle (Emys *(=Clemmys) marmorata marmorata*) is a California Species of Special Concern in California and is a Category 2 Candidate for Federal Listing. Northwestern pond turtle is the only native aquatic turtle in California. It is widely distributed west of the Cascades and Sierra Nevada. This species is found near and in water, especially slow moving or quiet waters, primarily ponds, small lakes, reservoirs, and quiet streams and rivers. They can be found basking on rocks, logs or on the bank along aquatic vegetation. Basking perches seem to be an important component of their habitat needs. Females lay a clutch of 5-11 eggs between April and August in a small hole in a dirt bank, sometimes at a distance from their home water. The diet of pond turtles consists of aquatic plants, fish, invertebrates and carrion.

Along the north coast of California, northwestern pond turtle is sparsely distributed, mainly at ponds in the interior. As recently as 2000, this species was observed in semi-permanently inundated woody dune hollows in Manila and have a moderate potential for occurrence within freshwater/riparian swamp within the CMA.

Herons and Egrets

Great Egret (*Ardea alba*) nesting rookeries are protected by the CDFG in California. Worldwide, one Great egret race breeds in North America and winters in South America. Another breeds in Europe and Russia and winters in Africa, and a third occurs in Singapore and is found from the Indian subcontinent to Southeast Asia to Australia and New Zealand. A common resident and breeder in California, great egret occurs in open or semi-open fish-bearing habitats and favors expansive shallows, marshes, rushy lakeshores, bays, sloughs, and marshlands, roosting in undisturbed trees and nesting in dense stands of trees or snags (Fix and Bezener 2000, Harris 1996). Great egret will also forage in grazed pastureland (Harris 1996). Current threats to this species include loss of wetland habitats, extermination as pests on fish farms, and raiding of nests for eggs.

Great Egret occurs within the CMA in association with marshy areas and tide flats and frequents Humboldt Bay at the eastern boundary of the CMA although no rookeries are known to occur.

Great Blue Heron (*Ardea herodias*) nesting rookeries are protected by the CDFG in California. Worldwide, great blue heron ranges throughout Alaska, Canada, British Columbia, North America, Central America, northwest South America, the West Indies, the Galapagos Islands, and rarely to the Hawaiian Islands. In California, this species is a common resident and breeder, occurring widely in a variety of coastal and upland wetland edge habitats such as rivers, lake shores, ponds, lowland marshes, bottomland pastures (including grazed pastureland), coastal bays, lagoons, intertidal rocks, and beaches (Fix and Bezener 2000, Harris 1996). Threats to this species are loss of wetlands as well as land development and human disturbance.

Great blue heron occurs within the CMA in association with marshy areas and tide flats and frequents Humboldt Bay at the eastern boundary of the CMA although no rookeries are known to occur.

Snowy Egret (*Egretta thula*) nesting rookeries are protected by the CDFG in California. Worldwide, snowy egret is distributed widely throughout North and South America, nesting along the Atlantic coast of North America, west in the coastal plain, and in scattered inland colonies between New Mexico, Colorado, and California. In California, Snowy egret is a year round resident, migrant, and summer breeder occurring in areas of shallow, standing, or slow moving water such as marshes, lakes, floodplains, stream sides, and tidal wetlands and during migration at reservoirs or along river corridors (Fix and Bezener 2000). Unlike other related species, snowy egret does not forage in grazed pastureland, preferring water-associated foraging habitat (Harris 1996). Current threats to Snowy egret include destruction of wetland habitats and human disturbance during breeding.

Snowy egret is locally common within and near the CMA, frequently foraging in Humboldt Bay. However, no rookeries are known from the CMA.

Black-crowned Night Heron (*Nycticorax nycticorax*) nesting rookeries are protected by the CDFG in California. Globally, black-crowned night heron is widely distributed throughout North and South America, Eurasia, and Africa. In California, this species is a common year-round resident and less common breeder, occurring in fresh and salt water marshes, pond margins, mudflats, sloughs, cropland, and slow-moving stream shorelines. Nesting occurs in dense stands of trees and brush, primarily in secluded areas (Fix and Bezener 2000, Harris 1996). Current threats to black-crowned night heron include loss of wetland habitat and human disturbance at nesting sites.

Black-crowned night heron is a common local resident and breeder in Humboldt County and is known to breed and roost at a number of sites within the lowands of the Mad River and around Humboldt Bay, likely including within the CMA.

Raptors

Cooper's Hawk (*Accipiter cooperi*) is a California Species of Special Concern at nesting sites. Worldwide, Cooper's hawk breeds in portions of Canada, and south into Mexico

and the southeastern United States and winter in portions of the mid and western United States and portions of Canada south into Middle America. In California, Cooper's hawk occurs in open woodlands and brushlands, nesting primarily in riparian habitat in foothills and valleys (Fix and Bezener 2000). Threats to Cooper's Hawk include habitat destruction, predominately occurring in lowland riparian areas, and disturbance at nest sites.

Migrating and wintering Cooper's hawks use riparian and woodland habitat throughout the CMA and breeding has occurred in suitable coastal coniferous forest in the vicinity of the CMA.

Sharp-shinned Hawk (*Accipiter striatus*) is a California Species of Special Concern at nesting sites. Worldwide, Sharp-shinned hawk breeds in portions of Alaska, Canada, and the contiguous United States and winters in potions of Canada, the contiguous United States, Latin America, and the Bahamas. In California, Sharp-shinned hawk breeds primarily in northern California in dense to semi-open coniferous, deciduous, or mixed forests, and occasionally along riparian edges. Current threats to Sharp-shinned Hawk include the potential impacts to California's small breeding population as a result of falconry and destruction of suitable habitat, primarily resulting from timber harvest.

Sharp-shinned Hawk has a low potential for occurrence within the CMA as the species is uncommon in the Humboldt Bay region. However, coastal coniferous forest could provide habitat for wintering or migrant birds.

Short-eared Owl (*Asio flammeus*) is a California Species of Special Concern at nest sites. Worldwide, Short-eared owl breeds from Alaska across Canada and south to California, Kansas, and New Jersey and winters in the southern part of its breeding range and south throughout the United States to Central America and in South America as well as most of the Old World. In California, short-eared owl nests only a few of its former breeding locations and in northwestern California breeds only in coastal areas where conditions are prime. This species is a ground nester and occurs in open country, including grasslands, wet meadows and cleared forests. In migration it may appear in alpine meadows (Fix and Bezener 2000). Current threats to short-eared owl are primarily decline and degradation of marsh and tall grassland habitat primarily as a result of grazing pressure.

Salt marsh habitats could provide suitable habitat for short-eared owl within the CMA where it has a moderate potential for occurrence. The species is known to occur in the Mad River Slough Wildlife Area just east to the Mad River Slough at the eastern edge of the CMA, at Eel River Wildlife Area and tidelands of the Eel River esuary, at Centerville, approximately 20 miles south of the CMA, Fay Slough, approximately 4 miles southeast of the CMA (Harris 1996, Hunter et al. 2005) and were observed recently on the south spit of Humboldt Bay, approximately 18 miles south of the CMA (S. McAllister, pers. obs.).

Northern Harrier (*Circus cyaneus*) is a California Species of Special Concern at nesting sites. Worldwide, northern harrier has a circumpolar distribution. In North America, this species is found from North Alaska east across Canada to the Atlantic Coast and south into Mexico, breeding from the northernmost portion of its range through the central United States and wintering in the Southern United States. Year-round residents also

occur throughout portions of North America. In California, northern harrier is distributed throughout the state primarily in open habitats, nesting in coastal fresh and saltwater marshes and foraging in grasslands, meadows, and marshes (Fix and Bezener 2000, Harris 1996). Current threats to this species are habitat destruction resulting from the agricultural and urban development.

Northern Harrier is known to occur within the CMA, commonly wintering and migrating through and uncommonly breeding and summering in coastal marshes and grasslands around Humboldt Bay.

White-tailed Kite (*Elanus leucurus*) is a California Fully Protected species at nesting sites. California supports the largest number of white-tailed kites in North America. Found in virtually all California lowlands west of the Sierra Nevada range and the southeast deserts, this species is also common in the Central Valley and along the entire California coast (Dunk 1995). White-tailed kite commonly inhabits agricultural and riparian areas, preferring habitats that do not support grazing pressure. Nest structures are shrubs or trees that generally provide concealment from the ground (Pickwell 1930, Hawbecker 1940).

White-tailed kite is known to occur within the CMA and is common within coastal lowland agricultural fields and wetland areas of the Mad River floodplain east of the CMA. Breeding has been confirmed in breeding bird atlas survey blocks that include Ma-le'l Dunes (Hunter et al. 2005).

Merlin (*Falco columbarius*). Populations of merlin that winter in California are considered California Species of Special Concern. Worldwide, merlin has a circumpolar breeding range occurring in northern temperate and sub and low Arctic regions and is migratory throughout most of its range, wintering in a variety of open habitat types in northern and southern temperate zones of Eurasia and the Americas. Merlin does not breed in California but is transient throughout much of the state, wintering along the coast and in the central valley in open country with scattered lookout posts such as estuaries, seacoasts, open woodlands, savannah, windbreaks and hedgerows, pastures and the edges of grasslands and agricultural fields (Fix and Bezener 2000, Harris 1996). Current threats to merlin primarily include persistent pesticide use on wintering areas in Central and South America and take for falconry.

Merlin is present each fall in open lowlands along the coast such as those within and near the CMA.

American Peregrine Falcon (*Falco peregrinus anatum*) was removed from the Federal Endangered Species List on 25 August, 1999 and is currently a California Fully Protected species at nest sites. Worldwide, this species breeds from northern Alaska through portions of Canada and the contiguous Untied States and occasionally in northern Mexico, and migrates from Greenland south through Canada and Alaska into the contiguous United States, through Mexico and into South America. In California, it ranges throughout most of the state with the exception of the deserts during migration and winter and breeds along the central and southern California coast and in the Channel Islands, inland north coastal mountains, Klamath and Cascade ranges, and the Sierra Nevada on ledges of large cliff faces or other similar structures in a variety of habitats including wetlands, woodlands, urban and agricultural areas and coastal habitats.

Peregrine Falcon has recovered throughout California. However, the threat of habitat destruction remains.

Peregrine Falcon is present within the CMA where suitable coastal lowland habitats supporting prey species such as shorebirds and other waterbirds occur. Peregrines also forage in Humboldt Bay near Ma-le'l Dunes.

Bald Eagle (*Haliaeetus leucocephalus*) is federally listed as threatened but has been proposed for delisting, is state listed as endangered and is a California Protected species at nesting sites.Worldwide, bald eagle is distributed throughout Canada, Alaska, and the contiguous United States. In California, bald eagle is found throughout most of the state near water bodies, breeding in the tops of trees or other similar structures near lakeshores, river banks, estuaries, and the sea coast; during winter and migration they inhabit both coastal and inland waterways (Fix and Bezener 2000, Harris 1996). Current threats include degradation of riparian and other water-associated habitats as well as disturbance at nest sites.

Bald eagle has a low potential for occurrence within the CMA as nesting habitat does not occur there although, during winter, occasional bald eagles may forage along the margins of Humboldt Bay, east of the CMA.

Osprey (*Pandion haliaetus*) is a California Species of Special Concern at nesting sites. This species has a worldwide distribution, occurring on every continent with the exception of Antarctica. In California, osprey is a common summer resident and breeder but is less common in winter. This species forages over bodies of water bearing fish. Breeding primarily in scattered locations throughout northern California from the Cascade Ranges south to Lake Tahoe, and along the coast south to Marin County osprey nests and roosts on exposed treetops, towers, pilings, or similar structures near lakes, reservoirs, rivers, estuaries, and the open sea coast (Fix and Bezener 2000, Harris 1996). Historically, ospreys were impacted by eggshell thinning caused by persistent pesticides such as DDT up until their ban in the 1970's. Current threats to the species primarily include degradation of aquatic environments such as rivers and lakes and loss of nesting structures such as trees to timber harvest and other activities.

Osprey is a common resident and breeder within and around the CMA. An active osprey nest is known from Ma-le'l North and is located atop a snag freshwater/riparian swamp adjacent to the railroad berm trail near the proposed wetland view deck.

Shorebirds

Western Snowy Plover

In 1993, the USFWS listed the coastal population of the western snowy plover (*Charadrius alexandrinus nivosus*) as a threatened population under the federal ESA (USUSFWS 1993) and designated critical plover habitat in September 2005 (USUSFWS 2005). The plover was listed based on evidence of a significant population decline, as well as a reduction in the number of breeding locations. Just prior to the time of listing, estimates (Page et al. 1991) placed the California population at 1,386 plovers, down 11 percent from the 1,565 plovers estimated a decade earlier (Page and Stenzel 1981). In

2000, a statewide breeding survey indicated a further decline of ~30% to 976 plovers in California (Page, unpublished data).

Two petitions to remove the coastal population of the western snowy plover from the Federal List of Threatened and Endangered Species, the first filed in September, 2002 by the Surf Ocean Beach Commission of Lompoc, California and the second filed in May, 2003 by the City of Morro Bay were submitted to the USFWS. These petitions contend that the coastal population does not qualify as a distinct population unit and therefore, is not threatened. The USFWS initiated status reviews on 22 March, 2004 upon finding that the petitions presented substantial information to warrant consideration of delisting (69 FR 13326). The 12-month finding on the delisting petitions was completed April 12, 2006, reconfirming the Pacific coast western snowy plover's status as threatened (71 FR 20607).

The causes of the western snowy plover's population decline were determined to be a combination of the following: 1) increased human recreational use of beach habitats (including off-highway vehicle (OHV) traffic); 2) alteration of nesting habitat from encroachment by European beach grass (*Ammophila arenaria*); and 3) predation of eggs and young by corvids (*Corvus brachyrhynchos*, *C. corax*), gulls (*Larus* spp.), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*) and striped skunk (*Mephitis mephitis*). These three factors either reduce reproductive and survival rates or cause plovers to avoid otherwise suitable habitat. Currently, plovers breed in coastal habitats (salt pans and levees, dredge spoil islands, river gravel bars, and unvegetated ocean beaches) at 28 locations from the central Washington coast to Baja, Mexico (USUSFWS 1993).

As part of the recovery plan, the USFWS designated Mendocino, Humboldt and Del Norte counties as a discrete management unit (Recovery Unit 2), one of six management units within the range of the listed population. Within Unit 2, snowy plovers breed and over-winter along ocean beaches and along the lower Eel River gravel bars. The majority of plovers breeding in Recovery Unit 2 occur in Humboldt County.

Historical records and recent surveys (Page and Stenzel 1981, Fisher 1992-94, LeValley 1999, Page unpublished data) indicate the importance of Humboldt County to breeding plovers. In 1977, Page and Stenzel (1981) found 64 birds (18 nests) at seven locations in the county and estimated that this represented 6% of coastal plovers breeding in California, and that Humboldt County had more plovers than any other location north of Monterey. During the breeding seasons of 1992-1994, Fisher conducted surveys of beach habitats and estimated 22-32 plovers initiated 17-26 nests. More recently, LeValley (1999) estimated that 49 birds (23 nests) bred at four locations in 1999; Interestingly, LeValley noted that plovers were absent from at least five beach sites where they were reported nesting by Page and Stenzel (1981) or Fisher (1992-1994). In 2000, this same area supported about 40 adults and 42 nests (McAllister et al. 2001). Over the past 6 years (2001-2006), increased research efforts provided estimates of 57-74 breeding plovers annually in Recovery Unit 2, nearly all of which were in Humboldt County (Colwell et al. 2006).

Historically, snowy plovers nested along much of the once open beaches of Humboldt County, including the north spit of Humboldt Bay, possibly within the area that now comprises the Ma-le'l Dunes CMA. Harris (1996) noted that two sets of eggs were

collected from the ocean beach near Samoa on 27 April, 1902 (M. and J. Davis *in* Harris 1996). However, following the introduction of European beachgrass to the west coast in the late 1800's and its subsequent encroachment onto Humboldt County beaches, local snowy plover use patterns have changed. The European beachgrass invasion has lead to the stabilization of many of Humboldt's dune systems and the loss of open sand available for habitat. This has drastically changed the suitability of much of the County's coastline for the snowy plover as the species requires open habitat for breeding. Within the CMA, the ocean regularly reaches the base of the foredune at high tide, even during the breeding season, both in areas that were altered by European beachgrass and in those that have never been invaded.

Inter-agency breeding season (March-September) surveys conducted approximately once per month since 1997 on the north spit of Humboldt Bay, including the beaches (but not the back dunes) within the CMA, have not detected snowy plovers. Annual winter surveys of the same areas have also failed to record plovers. However, Ron LeValley reported the observation of a non-breeding individual in the vicinity in 1996, south of the Mad River Slough and Dunes CMA on the adjacent BLM property (LeValley, pers. comm.). More recently, 5 snowy plovers were observed on 17 December, 2005 during the Arcata Christmas Bird Count. These birds were recorded on the north spit just west of the Fairhaven Electric building, approximately 6 miles south of the Ma-le'l Dunes CMA (Kerry Ross, pers. comm.). Currently the closest known breeding locations for plovers in relation to the CMA are at Mad River Beach, approximately 4.5 miles north of the action area and at the south spit of Humboldt Bay, approximately 8 miles south of the action area (Colwell et al. 2006).

Although the beach at the Ma-le'l Dunes CMA appears too narrow to support breeding western snowy plover; the back dunes do represent suitable breeding habitat. Plovers are known to nest in back dune areas from a number of coastal locations in Oregon and southern California, including beaches backed by steep dunes such as at Oceano Dunes State Vehicular Restoration Area. Locally, plovers are known to nest in back dunes at Clam Beach.

Long-billed Curlew (*Numenius americanus*) federally listed as a Species of Concern, and by the CDFG as a California Species of Special Concern at nesting sites. Worldwide, long-billed curlew breeds in southwestern Canada and in the western United States, and winters in the southern United States to South and Central America. In California, Long-billed curlew breeds in wet meadow habitat in northeastern California in Siskiyou, Modoc, and Lassen Counties and winters in large flocks along most of the California coast as well as the Central and Imperial valleys (in tidal mudflats, estuaries, saltwater marshes, tidal channels, grasslands, and agricultural fields with short grasses (Fix and Bezener 2000). Current threats to long-billed curlew include loss and degradation of prairie and meadow breeding habitat due to grazing and agricultural pressures.

Long-billed curlew has a moderate potential for occurrence within the CMA and is present in Humboldt Bay near the CMA during migration and winter; it may also use the coastal habitat of CMA for foraging.

Land birds

Vaux's Swift (*Chaetura vauxi*) is federally listed a threatened at nest sites. Worldwide, Vaux's swift breeds from southeastern Alaska and Montana to central California and winters in the tropics. In California, Vaux's swift breeds in coastal coniferous forests, with a significant minority now using chimneys in towns and cities. The species forages in forest openings, burned-over forest, meadows, rivers, lakes, and suburbia. Nearly all roost sites in migration are detected in chimneys (Fix and Bezener 2000). Current threats to Vaux's swift include loss of suitable nest sites such as large, hollow snags and old Pileated Woodpecker cavities as well as human disturbance especially from fires in fireplaces where swifts may nest or roost.

Vaux's swift has a high potential for occurrence within the CMA within coastal coniferous forest.

Yellow warbler (*Dendroica petechia brewsteri*) is a California Species of Special Concern at nesting sites. Worldwide, the northern form of the yellow warbler (*Dendroica* petechia), which includes the California subspecies, breeds from Alaska to Newfoundland and southern Labrador south to western South Carolina and northern Georgia, and west through the southwest to the Pacific coast and winters in Central America and the West Indies south to northern Peru. In California, yellow warbler nests primarily in alder-cottonwood-willow stands with riparian cover and occupies habitats along the coastal strip during migration (Harris 1996). Current threats to yellow warbler include degradation and loss of alder-cottonwood-willow and riparian habitats as well as nest parasitism by Brown-headed Cowbird (*Molothrus ater*).

Yellow warbler is present within the CMA and likely to occur within willow-dominated dune swales, freshwater/riparian swam and potentially coastal coniferous forest during migration. Yellow warbler is not known to breed here.

Willow Flycatcher (*Empidonax traillii*) is a Federal Species of Concern at nesting sites. Worldwide, Willow Flycatcher, a Neotropical migrant, breeds in riparian and mesic upland thickets in the United States and Canada and winters from Mexico south to Panama (AOU 1983). In California, Willow Flycatcher typically breeds in moist meadows with perennial streams, lowland riparian woodlands dominated by willows, cottonwoods, or in smaller spring- fed boggy areas with willows or alders (Serena 1982, Harris et al. 1987, Whitfield 1990). Threats to Willow Flycatcher primarily include loss of riparian habitat due to invasion of non-native species, channelization and damming of free flowing rivers, and nest parasitism by Brown-headed Cowbird (*Molothrus ater*).

Willow Flycatcher has a low potential for occurrence in the CMA. Although migrants of this species may be found in the dune hollows and limited willow habitats within the CMA, the woody hollows and riparian woodlands at the CMA are not substantial enough to be suitable habitat for breeding Willow Flycatchers.

Black-capped Chickadee (*Poecile atricapilla*) is a California Species of Special Concern. Worldwide, black-capped chickadee is largely resident from Alaska east across Canada to Newfoundland and south to northern California, northern New Mexico, Missouri, and northern New Jersey and winters south to Maryland and Texas. In California, black-capped chickadee occurs in mixed hard and softwood forests, natural

and suburban woodlands, scattered trees, shrubs, thickets, old fields, clear cuts, forest edges, and dense undergrowth, as well as suburban areas such as parks and gardens. The primary current threat to black-capped chickadee is degradation and destruction of riparian habitat.

Black-capped chickadee occurs throughout the CMA in coastal coniferous forest, woody dune swales, freshwater/riparian swamp, and thickets. It is also likely to occur in adjacent suburban habitats.

Purple Martin (*Progne subis*) is a California Species of Special Concern at nesting sites. Worldwide, purple martin breeds throughout much of southern Canada and less commonly in western Canada as well as portions of the contiguous United States, Mexico, and Cuba, wintering in South America from southeastern Brazil northward and westward to the eastern portions of Bolivia and Columbia northward to the southern Caribbean Islands. In California, purple martin breeds in riparian woodlands, oak woodlands, partially logged, broken, or burned coniferous forests, and montane mixed forests, nesting in cavities (usually old woodpecker cavities) of tall trees, often near water (Fix and Bezener 2000). This species also breeds where human settlement occurs, often nesting in nest-boxes (Baicich and Harrison 1997). Foraging occurs over bottomlands, bays, coastal lagoons, ponds, and wetlands. During migration purple martin occurs over rivers, reservoirs, and agricultural fields (Fix and Bezener 2000). Current threats to purple martin include nest cavity competition with introduced European starling (*Sternus vulgaris*) and loss of nesting structures due to removal of snags.

Purple martin has a high potential for occurrence within the CMA as suitable habitat occurs within and around ma-le'l Dunes. Breeding could occur but has not been documented and In Humboldt County, appears to be somewhat removed from the immediate coast (Hunter et al. 2005).

Bank Swallow (*Riparia riparia*) is a state listed as threatened. Worldwide, bank swallow is the most widely distributed of the swallows, with breeding colonies scattered across the northern hemisphere, from western North America to eastern Eurasia. This species winters in Central and South America or in Africa and Central Asia. In California, bank swallow breeds in areas with vertical embankments high enough for them to avoid predation and with friable substrates that allow for excavation of a nest cavity. These embankments are typically found along rivers, streams, lakes, gravel pits, and road cuts. Foraging habitat generally consists of open areas where this species can take prey, primarily insects, on the wing such as agricultural fields. The primary current threat to bank swallow is destruction of natural stream banks from practices such as rip-rapping.

Bank swallow has a low potential for occurrence within the CMA. No breeding habitat is present in the vicinity of the CMA although rare migrants could use the area for foraging.

Aquatic birds

California Brown Pelican (*Pelecanus occidentalis californicus*) is federally listed as threatened, state listed as endangered and is a California Fully Protected species at nesting colonies. It occurs throughout temperate and subtropical North American marine and estuarine waters. Truly inland occurrences in California (away from the vicinity of the Salton Sea) are unusual, particularly so in the northern portion of the state. Breeding

occurs along the Atlantic coast from Chesapeake Bay (recently) south through the Gulf of Mexico and into coastal South America and on the Pacific Coast from southern California southward along the west Mexican coast into South America (Galapagos Islands). Along temperate North American coasts, birds annually move northward following the breeding season. Along the West coast, large numbers occur from mid-summer through fall northward to southwestern Washington and sparingly to Puget Sound and southwestern British Columbia. A southward passage in late fall leaves very few brown pelicans north of central California.

Brown pelicans reach the northern limit of their breeding range on the Pacific Coast along the southern half of the California coast. Historically, breeding populations of these birds in southern California have fluctuated in response to environmental conditions. Current thought suggests that these populations increase during periods of ocean warming (Baldridge 1973, Anderson and Anderson 1976). The brown pelican breeds regularly in California only on West Anacapa Island and has nested only rarely elsewhere in the Channel Islands, specifically on Prince Island, Santa Cruz Island, and Santa Barbara Island. Adding evidence to the case for continued resurgence of the species were hundreds of brown pelicans that initiated nesting at Pt. Lobos State Reserve, Monterey County during April and May 2000 (Terrill et al. 2000). The previous successful nesting there was in 1959 and the most recent attempt was in 1966. The possibilities exist that the species may re-establish small breeding colonies along the central California coast or colonize previously unutilized sites.

Nesting habitat consists of coastal islands just outside the surf line. A colonial nester, the brown pelican typically nests on small-to moderately sized islands to avoid predation by ground-dwelling species.

In the late 1960s and early 1970s, the reproductive success of brown pelicans declined considerably in California and northern Mexico. From 1969 to 1971 only 12 chicks fledged out of 2,368 nesting attempts (Anderson and Anderson 1976). The breeding failures of pelicans during this period were related to the high levels of DDE, the principal metabolite of DDT, in the marine environment (Schreiber and Delong 1969, Schreiber and Riseborough 1972, Jehl 1973, and Anderson 1976).

Reproductive success of brown pelicans can vary markedly from year to year. Changes in oceanographic conditions and in the distribution and abundance of forage fish are two interrelated factors that may account for this fluctuation.

Critical Habitat has not been designated for brown pelican.

Brown pelican uses the near-shore Pacific Ocean and the offshore rocks and islands of the California coast for roosting and loafing sites and nests offshore. Nesting habitat consists of coastal islands just outside the surf line. A colonial nester, the brown pelican, typically nests on small-to moderately sized islands to avoid predation by ground-dwelling species.

California brown pelican is present within the CMA and uses the nearshore Pacific Ocean west of the CMA and may occasionally use the beach and coastal promontories for day roost sites. The species also uses Humboldt Bay east of the CMA extensively for foraging, loafing and roosting. However, no nest sites are known north of Monterey Bay.

Double-crested Cormorant (*Phalacrocrax auritus*) is a California Species of Special Concern at rookery sites. Worldwide, double-crested cormorant is confined to North America. In California it breeds inland on lakes and coastally in colonies on nearshore rocks and islands. Historically, double-crested cormorant has been affected by human disturbance in the form of disruption at colonies and persecution, and was among the piscivorous (fish-eating) bird species most affected by eggshell thinning caused by persistent pesticides such as DDT up until their ban in the 1970's. Their numbers have dramatically increased in recent years. However, current threats exist and include direct persecution, harassment, and disturbance at colonies and roosting sites. They also remain vulnerable to gull predation (Kury and Gochfeld 1975).

Double-crested cormorant is present within the CMA, occurring locally, year-round and breeding on piling within Humboldt Bay near the old Arcata Wharf, approximately 3 miles southeast of the CMA. They also forage in Humboldt Bay and the ocean adjacent to the CMA and roost on pilings along the bayshore.

Elegant Tern (*Sterna elegans*) is a California Species of Special Concern at nesting colonies. Worldwide, elegant tern breeding distribution is extremely restricted, occurring almost exclusively on islands in the Gulf of California/Mexico, and portions of the southern California coast. Its winter range is primarily along the coast of western South America from Peru to Chile. In California, the elegant tern breeds predominantly on islands in the Sea of Cortez and along the coast of Southern California and migrates along the California coast in late spring, summer, and early fall only occurring in coastal habitats such as inshore ocean, estuaries, coastal freshwater and salt lagoons, river mouths and creek outfalls and is rarely seen in inland habitats (Fix and Bezener 2000). Current threats to elegant tern primarily include human disturbance at nesting colonies.

Elegant tern has a high potential for occurrence within the CMA and is a fall visitor to northwestern California and frequents the bayshore along the North Spit of Humboldt Bay, including within the CMA. Nesting is highly unlikely.

Mammals

White-footed vole (*Arborimus albipes*) is a California Species of Special Concern and inhabits mature coastal forests in Humboldt and Del Norte Counties. Areas near small, clear streams with dense alders and shrubs are preferred. White-footed vole occupies habitat from the ground surface to the canopy in appropriate habitat and forages in all layers. Nesting occurs on the ground under logs or rocks.

White-footed vole is known to occur within the vicinity of CMA and likely within the CMA itself. A CNDDB occurrence record exists for an area west of the Mad River Slough, approximately 2.5 miles south-southwest of Tyee City. This occurrence is just north of the CMA in beach pine forest similar to that of the CMA.

Sonoma tree vole (*Arborimus pomo*) is a Federal Species of Concern and a CDFG Species of Special Concern. Worldwide, Sonoma tree vole occurs in coastal Oregon and northwestern California. In California, this species primarily inhabits Douglas fir forests but may occupy redwood or Sitka spruce forests and areas with salal (*Gaultheria shallon*) (Whitaker 1998). Current threats to this species include habitat degradation or destruction

in the form of clear cuts, forest fires, and other factors that create openings in the forest and isolate blocks of trees.

Sonoma tree vole has a low potential for occurrence within the CMA. Although the species is known from coastal sites, suitable Douglas fir habitat is absent from the CMA.

Environmental Consequences

Alternative A: Proposed Action

Native Vegetation

The Plan proposes many actions that are expected to eliminate substantial adverse impacts to sensitive and native plant communities, including the estuarine wetlands of the Mad River Slough, the understory of the coniferous forest where a number of locally rare plants can be found, and the native dune mat community within the nearshore dunes. Such proposed actions include: the use of regulatory, boundary and directional trail signs, the decommission of various casual trails currently in use including the trail that leads to the bank of Iron Creek, the use of symbolic fencing, the installation of a split rail fence between the parking area at Ma-le'l North and the slough to eliminate or minimize foot traffic in salt marsh habitats, and the monitoring of compliance for public use activities through caretaker presence, law enforcement patrols, and BLM/USFWS staff field visits.

Adverse impacts to native plant communities resulting from on-going plant and traditional resource gathering, and the possible trampling of native vegetation from pedestrians, dogs or horses walking outside the designated trail corridor would be minimized to less than significant through the monitoring of CMA resources and public use activities by BLM and USFWS resource managers as proposed in the Plan. Such monitoring would enable managers to identify where adaptive management strategies would be implemented to protect native plant communities. This would include installing additional signage or decommissioning trails in areas where damage to natural resources is occurring as a result of unauthorized uses. In addition, off-trail plant gathering at Ma-le'l South and traditional resource gathering throughout the CMA would be regulated by the issuance of special permits.

The proposed expansion of the parking area at Ma-le'l North involves the removal of approximately eight young beach pine trees and the placement of crushed gravel to accommodate a new access driveway to the parking area. Currently, much of the area surrounding the parking area is degraded by the invasion of exotic, annual grasses. The expansion of the parking area has been designed in a manner to minimize tree removal. Further, because the area was heavily cleared for the construction of the original parking area, the removal of an additional eight young trees is insignificant, especially when considering the active reforestation effort being undertaken by the USFWS on other portions of the project area through implementation of the USFWS-HBNWRC "Restoration Plan for the Humboldt Bay National Wildlife Refuge – Ma-le'l Dunes" (EDAW, 2005). The restoration plan incorporates coastal forest restoration activities in three acres surrounding and adjacent to the proposed Ma-le'l North parking area. As the beach pines mature within the vicinity of the parking area, the understory is expected to

develop a more native species composition as the grasses become shaded out. The restoration plan will also work to eliminate non-native vegetation in other areas of Ma-le'l North, including portions of the coniferous forest and throughout the nearshore dunes. Similarly, BLM will continue to conduct weed monitoring and eradication work throughout the Ma-le'l South properties.

The Plan proposes that dilapidated cabins near the meadow in the northern portion of Ma-le'l North would be dismantled and removed, and the area where the buildings once stood would revert to natural landscape. This measure would serve to mitigate for the minor vegetation removal necessary at the caretaker trailer pad.

The Plan proposes that an existing wetland observation deck that extends out over the riparian swamp would be repaired and made more structurally secure by installing two post piles, which would together occupy less than one square foot. However, if this design proves to be infeasible then a cantilever support system similar to the existing structure will be constructed and would avoid any wetland impacts (HWR Engineering & Science 2006). In addition, a 15-foot long, 4-foot wide footbridge will be installed in the nearshore dunes. The impact to native vegetation due to post piles beneath the view deck and coverage of wetland by the footbridge is considered small (approximately 60 ft^2) and insignificant. However, under the proposed access plan, the extensive system of remnant and unused wire fencing and posts in the nearshore dunes, some of which occur in wetland swales, will be removed to improve aesthetics and alleviate tripping hazards. This measure will partly mitigate for the installation of the footbridge in the nearshore dunes.

Within the Plan, permanent impacts to native vegetation that would occur due to implementation of the Proposed Plan Alternative A. These include:

- The displacement of approximately 60 ft^2 of wetland vegetation (i.e. wetland fill) for the installment of footings for the footbridge over the seasonal wetland in the nearshore dunes;
- The displacement of less than one square foot of wetland vegetation due to the installation of two post piles as part of the repair of the wetland view deck along the railroad berm trail at Ma-le'l North; and,
- Installation of the canoe/kayak landing ramp at Ma-le'l North is expected to permanently remove a minor amount of wetland vegetation (less than 200 ft^2) composed mostly of dense-flowered cordgrass with associated native pickleweed, jaumea, saltgrass, and possibly Point Reyes bird's-beak and Humboldt Bay owl's-clover. Dense-flowered cordgrass is an invasive exotic plant in Humboldt Bay that displaces native salt marsh vegetation.

Identified and potential on-going impacts to native vegetation upon implementation of the Proposed Plan Alternative A includes routine vegetation clearing to maintain an open trail corridor through the CMA.

Implementation of the following mitigation measures would ensure that the Proposed Plan Alternative A would not substantially impact or adversely affect native vegetation.

Mitigation Measure 1: Planned improvements will occur during the dry season in seasonal wetlands and will incorporate Best Management Practices (BMPs) to control sediment transport, such as conducting work during low tide, and use of silt fencing if necessary.

Mitigation Measures 5:

One hundred and seventy-five square feet (175 sf) of high salt marsh habitat (6.4 to 8.9 feet above mean-low-low-water) that is dominated by dense-flowered cordgrass (*Spartina densiflora*) would be restored with pickleweed (*Salicornia virginica*) and saltmarsh (*Distichlis spicata*) and maintained as such as mitigation for the installation of the canoe/kayak landing/launching ramp.

Mitigation Measures 6: The development of a maintenance program for the trail to insure that routine vegetation clearing does not adversely affect any locally rare plants identified by the CMA resource managers.

Wildlife

Increased disturbance associated with higher public use rates, including those associated with the continued allowance of dogs and horses at Ma-le'l South, will be minimized to less than substantial via measures identified in the access plan that will concentrate public access. Such measures include the installation of regulatory, boundary and directional trail signs, the decommissioning of various casual trails currently in use, symbolic fencing, and the monitoring of compliance of allowable public uses through caretaker presence, law enforcement patrols, and BLM/USFWS staff field visits. These mitigation measures are expected to limit public access to sensitive plant communities and thus the wildlife they support, including the estuarine wetlands of the Mad River Slough, the understory of the coniferous forest and the native dune mat community within the nearshore dunes. Through the monitoring of CMA resources and public use activities, BLM and USFWS resource managers will be able to identify where adaptive management strategies may be implemented to protect wildlife, if deemed necessary. This may include installing additional signage or decommissioning trails in areas where excessive disturbance to wildlife or destruction of wildlife habitat is occurring as a result of authorized uses.

In summary, implementation of the Proposed Plan Alternative A could result in the following potential impacts to wildlife:

- The ongoing potential for disturbance to breeding birds associated with routine vegetation clearing to maintain an open trail corridor through the CMA,
- The potential for disturbance to breeding birds associated with the expansion of the parking area at Ma-le'l North involving the removal of approximately eight young beach pines and the placement of crushed gravel,
- The potential for siltation into dune swales and freshwater/riparian swamp, and the associated impacts to suitable amphibian and reptile habitat, that could

result from the proposed installation of a foot bridge over the seasonal wetland in the nearshore dunes and the wetland view deck along the Railroad berm Trail at Ma-le'l North,

- Disturbance to potentially nesting ospreys associated with the installation of the wetland view deck near the currently active osprey nest located approximately 50 meters west of the Railroad berm Trail at Ma-le'l North, and
- The potential for siltation into the Mad River Slough, and associated impacts to water quality and thus fish habitat, that could result from construction of the canoe and kayak launching ramp at Ma-le'l North.

Implementation of the following mitigation measures would ensure that the proposed Plan and associated activities (such as the improvement of the parking area at Ma-le'l North, installation of the canoe and kayak ramp, installation of the foot bridge, repair of the wetland view deck, and routine vegetation clearing), as described in Alternative A Proposed Action, would not substantially impact or adversely affect wildlife, including the active osprey nest at Ma-le'l North.

Mitigation Measure 1:

Planned improvements will occur during the dry season in seasonal wetlands and will incorporate Best Management Practices (BMPs) to control sediment transport, such as conducting work during low tide, and use of silt fencing if necessary.

Mitigation Measure 2:

During the breeding season for birds likely to breed in the Ma-le'l Dunes Cooperative Management Area (CMA) (February 15 to August 15), construction activities and routine maintenance would utilize only non-mechanized equipment. Only hand tools and clippers would be allowed during this period, except to address emergency and/or public safety conditions when mechanized equipment would be allowed. The use of mechanized equipment within the breeding season for birds likely to breed in the Ma-le'l Dunes CMA to address emergency conditions would be conducted at the discretion of the Ma-le'l Dunes CMA managers.

Threatened, Endangered and Special Status Species

Threatened, Endangered and Special Status Plants

The nearshore dunes of the CMA contain important habitat for five special status vascular plants. These include the federal and state-listed endangered Humboldt Bay wallflower and beach layia; the CNPS list 1B pink sand verbena and dark-eyed gilia; and the CNPS list 4 American glehnia. In addition, Humboldt Bay owl's-clover and Point Reyes bird's-beak, both listed as CNPS 1B, are known to occur within the high salt marsh habitats of the Mad River Slough at Ma-le'l North, and Lyngbye's sedge, a CNPS list 2 species, occurs in brackish areas along the banks of the slough.

Activities associated with the proposed action that have the potential to adversely affect these species include any activity that may cause ground disturbance where these species occur. These are discussed in detail below.

The expansion of the existing trail system within the nearshore dunes and the anticipated increase in foot traffic in these areas upon implementation of the access plan, installation of signs within or adjacent to endangered plant areas, construction of the foot bridge over the seasonal wetland, potential sediment transport to salt marsh habitats within the slough during construction of the boat ramp, and possibly an increase in foot traffic in adjacent salt marsh habitats associated with the launching or landing of boats at Ma'le'l North.

Activities associated with the proposed action that have the potential to adversely affect these species include any activity that may cause ground disturbance where these species occur. This includes the expansion of the existing trail system within the nearshore dunes and the anticipated increase in foot traffic in these areas upon implementation of the access plan, installation of signs within or adjacent to endangered plant areas, construction of the foot bridge over the seasonal wetland, potential sediment transport to salt marsh habitats within the slough during construction of the boat ramp, and possibly an increase in foot traffic in adjacent salt marsh habitats associated with the launching or landing of boats at Ma'le'l North.

Approximately 354 linear feet of new trail will pass through or immediately adjacent to (within 50 foot) threatened, endangered, and/or special status plant areas located within the nearshore dunes (See Figure 6 and 7). Most of this "new trail" represents existing casual trails that pass through areas that support beach layia and/or dark-eyed gilia. Beach layia and dark-eyed gilia are locally common within the dune mat vegetation type on the North Spit, but they also occur in lower densities within open sand areas such as the proposed trail alignment. Foot traffic in these areas has the potential to damage or destroy seed and/or reproductive individuals that may colonize here in the future. However, given the relatively high density of beach layia and dark-eyed gilia within the Humboldt Bay dunes, and on the North Spit in particular, adverse impacts to individuals that may inhabit the trail are not considered substantial to the populations of these species on a whole.

The proposed trail alignment avoids all known occurrences of Humboldt Bay wallflower, pink sand verbena and American glehnia. The trail passes immediately adjacent to one significant occurrence of wallflower near the Ki-mak Trail at Ma-le'l North, and two smaller occurrences near the Latkak Trail at Ma-le'l South. The rare plant distribution maps (Figure 6 and 7) shows the trail alignment abutting these locations; however for clarification it should be noted that the trail directs foot traffic around these occurrences, and at Ma-le'l North, is positioned within a swale at the base of the dune that supports wallflower on its upland flanks. The use of fencing around colonies of Humboldt Bay wallflower that occur near the proposed trail was considered, but determined to be too difficult to maintain in the dune environment, and also incompatible with the objectives of the public access plan, which is to minimize fencing throughout the CMA in order to retain the natural look of the area. Furthermore, interpretative education on kiosks and brochures regarding rare plants combined with visual opportunities in the field will foster appreciation and stewardship of the species.

Direct impacts to the wallflower and other rare dune plants could result from pedestrians, dogs or horses leaving the trail corridor and walking within rare plant areas, potentially crushing seed and reproductive individuals. Ground disturbance associated with off-trail foot traffic may also indirectly impact rare plants by causing degradation of suitable habitat areas (i.e. dune mat). Additionally, wallflower and beach layia are likely to recruit along trail edges, which will then be subject to trampling by pedestrians walking along the trails corridors.

The use of regulatory, boundary and directional trail signs, the decommission of various casual trails currently in use, symbolic fencing, and the monitoring of compliance for public use activities through caretaker presence, law enforcement patrols, and BLM/USFWS staff field visits, is expected to limit public access to endangered plant areas located within the CMA and the adjacent Lanphere Dunes Unit of HBNWR, thereby minimizing impacts to existing populations of rare plants to less than significant. In addition, through the monitoring of CMA resources and public use activities, BLM and USFWS resource managers will be able to identify where adaptive management strategies may be implemented to protect sensitive resources. This would include installing additional signage or decommissioning trails in areas where damage to natural resources is occurring as a result of authorized uses.

The proposed trail alignment within the nearshore dunes is considered the least damaging alternative to existing rare plant occurrences, while providing consideration for the protection of sensitive cultural resources that also occur in this area. Although the proposed action is expected to result in an increase in public use of the beach and nearshore dunes, the action also provides for the consolidation of foot traffic by establishing a designated trail system through these sensitive habitat areas. Rare salt marsh plants in the vicinity of the proposed boat landing at Ma-le'l North will be protected by establishing clearly marked access points to the boat landing, signage and, if necessary, symbolic fencing to discourage entry into the adjacent salt marsh habitats.

Construction of the boat ramp is expected to permanently remove a minor amount of wetland vegetation (less than 200 ft^2) that may support Point Reyes bird's-beak and Humboldt Bay owl's-clover. In addition, in the absence of best management practices (BMPs) during construction, individuals that occur in the adjacent salt marsh could be adversely affected from sedimentation, which has the potential to bury seed or reproductive individuals.

Adverse impacts to Lyngbye's sedge are not expected since the sedge is not easily accessed from the trail, nor is the sedge located near any boat launching or landing area.

In summary, the implementation of the proposed action Plan could result in the following potential impacts to threatened, endangered and special status plant species:

- Direct impacts to the wallflower and other rare dune plants could result from pedestrians, dogs or horses leaving the trail corridor and walking within rare plant areas, potentially crushing seed and reproductive individuals. Ground disturbance associated with off-trail foot traffic may also indirectly impact rare plants by causing degradation of suitable habitat areas (i.e. dune mat).

- During the implementation of the canoe and kayak ramp Humboldt Bay owl's-clover or Point Reyes bird's-beak could be adversely affected by removal of salt marsh vegetation, or from sedimentation which has the potential to bury seed or reproductive individuals. Other potential impacts to the rare salt marsh plants could result from an increase in foot traffic within salt marsh habitat near the proposed boat landing at Ma-le'l North.

Implementation of the following mitigation measures would ensure that the Proposed Action Alternative A, would not substantially impact or adversely affect threatened, endangered or special status plants.

Mitigation Measure 1:

Planned improvements will occur during the dry season in seasonal wetlands and will incorporate Best Management Practices (BMP's) to control sediment transport, such as conducting work during low tide, and use of silt fencing if necessary.

Mitigation Measure 3:

The USFWS will implement Humboldt Bay wallflower seed collection from existing populations on the adjacent Lanphere Dunes Unit, and subsequent dispersal within newly restored areas of the Fernstrom-Root and Ma-le'l parcels. This measure is designed to facilitate the expansion of the wallflower within the CMA and mitigate for potential adverse impacts from off-trail foot traffic. The refuge will obtain a recovery permit.

Mitigation Measure 4:

All construction activities occurring within or adjacent to endangered plant areas would be supervised by Ma-le'l Dunes CMA resource managers and would take place outside of the growing season to avoid impacts to reproductive individuals. In addition, before the commencement of work and when species are clearly visible all occurrences of Humboldt Bay wallflower rosettes (reproductive season is approximately March 1 through the end of the summer), beach layia (reproductive season is March to May), Humboldt Bay owl's-clover (reproductive season is May through July), Point Reyes bird's-beak (reproductive season is approximately June 1 through end of summer), and other rare plant species located near construction areas would be flagged and the CMA resource managers would document any adversely affected individuals.

Threatened, Endangered and Special Status Animals

Fish

The Mad River slough, which meanders through the eastern edge of Ma-le'l North provides potential habitat for five species of special status fish: tidewater goby, coast cutthroat trout, the southern Oregon/northern California coho salmon evolutionarily significant unit (ESU), the northern California steelhead ESU and the California coastal Chinook salmon ESU. Tidewater goby is federally endangered and a California Species of Special Concern. Coast cutthroat trout and the southern Oregon/northern California

coho salmon ESU are both California Species of Special Concern. The northern California steelhead ESU and California coastal Chinook salmon ESU are federally threatened.

Activities associated with the proposed action that have the potential to adversely affect threatened, endangered and special status fish include:

- Temporary impacts to water quality and sediment transport within the Mad River Slough due to construction of the canoe/kayak launching ramp.

Implementation of the following Mitigation Measure 1 would ensure that the Proposed Action Alternative A, would not substantially impact or adversely affect threatened, endangered or special status fish.

Amphibians and Reptiles

Coniferous forest and freshwater wetland areas such as those mapped as riparian/ freshwater swamp (including Iron Creek and potentially the spring near the Ma-le'l North parking lot) and dune swales provide habitat for one special status amphibian, northern red-legged frog, and one special status reptile, northwestern pond turtle, both California Species of special concern.

Activities associated with the proposed action that have the potential to adversely affect northern red-legged frog and northwestern pond turtle include:

- Temporary impacts to water quality due to sediment transport in freshwater environments where northern red-legged frog and northwestern pond turtle could occur. This includes the potential for sediment transport associated with construction of the footbridge over the seasonal wetland in the nearshore dunes and the wetland view deck over freshwater/riparian swamp adjacent to Railroad berm Trail, both at Ma-le'l North.

Implementation of the following Mitigation Measure 1 would ensure that the Proposed Action Alternative A, would not substantially impact or adversely affect special status amphibians and reptiles.

Mitigation Measure 1:

Planned improvements will occur during the dry season in seasonal wetlands and will incorporate Best Management Practices (BMPs) to control sediment transport, such as conducting work during low tide, and use of silt fencing if necessary.

Herons and Egrets

Four species of special status herons and egrets occur throughout the CMA, great egret, great blue heron, snowy egret and black-crowned night heron. Although these species are found all throughout Humboldt Bay, they primarily frequent areas of the CMA near marshes, freshwater/riparian swamp, and tidal mud flats associated with the Mad River Slough.

Adverse impacts to special status herons and/or egrets are not expected since the Plan proposes to minimize disturbance associated with increased public use including the installation of regulatory, boundary and directional trail signs, the decommissioning of various casual trails currently in use, symbolic fencing and monitoring of compliance with allowable public use policy through caretaker presence, law enforcement patrols, and BLM/USFWS staff field visits. These measures are expected to limit public access to heron and egret habitat occurring in the estuarine wetlands of the Mad River Slough, the understory of the coniferous forest and within the nearshore dunes.

Activities associated with the proposed action that have the potential to adversely affect herons and/or egrets include:

- The ongoing potential for disturbance associated with routine vegetation clearing to maintain an open trail corridor through the CMA,
- The potential for disturbance to breeding birds associated with the expansion of the parking area at Ma-le'l North involving the removal of approximately eight young beach pines and the placement of crushed gravel.

Implementation of the following Mitigation Measure 2 would ensure that the Proposed Action Alternative A, would not substantially impact or adversely affect herons and egrets.

Mitigation Measure 2:

During the breeding season for birds likely to breed in the Ma-le'l Dunes Cooperative Management Area (CMA) (February 15 to August 15), construction activities and routine maintenance would utilize only non-mechanized equipment. Only hand tools and clippers would be allowed during this period, except to address emergency and/or public health and safety conditions when mechanized equipment would be allowed (such as restroom pumping and road grading). The use of mechanized equipment within the breeding season for birds likely to breed in the Ma-le'l Dunes CMA to address these conditions would be conducted at the discretion of the Ma-le'l Dunes CMA managers.

Raptors

Nine species of special status raptors occur throughout the CMA in association with different habitat types and include Cooper's and sharp-shinned hawks, short-eared owl, northern harrier, white-tailed kite, merlin, peregrine falcon, bald eagle and osprey. Cooper's and sharp-shinned hawks, short-eared owl, northern harrier, merlin and osprey are California Species of Special Concern. White-tailed kite, peregrine falcon and bald eagle are California Fully Protected species. Special status raptors are either known to occur or have the potential for occurrence within all of the habitats of the CMA.

Adverse impacts to special status raptors are not expected since measures have been implemented to minimize disturbance associated with increased public use including the installation of regulatory, boundary and directional trail signs, the decommissioning of various casual trails currently in use, symbolic fencing and monitoring of compliance with allowable public use policy through caretaker presence, law enforcement patrols, and BLM/USFWS staff field visits. These measures are expected to limit public access to

raptor habitat occurring in the estuarine wetlands of the Mad River Slough, the understory of the coniferous forest and native dune mat communities within the nearshore dunes.

Activities associated with the proposed actions that have the potential to adversely affect raptors include:

- The ongoing potential for disturbance associated with routine vegetation clearing to maintain an open trail corridor through the CMA,
- The potential for disturbance to breeding birds associated with the expansion of the parking area at Ma-le'l North involving the removal of approximately eight young beach pines and the placement of crushed gravel.

Implementation of the following Mitigation Measure 2 would ensure that the Proposed Action Alternative A, would not significantly impact or adversely affect special status raptors.

Shorebirds

Two species of special status shorebirds occur in association with the beach habitat of the CMA, western snowy plover and long-billed curlew. Western snowy plover is federally threatened and long-billed curlew is a California Species of Special Concern.

No adverse impacts to long-billed curlew are expected because the CMA does not contain suitable breeding habitat for the species, which breeds in upland short grass prairies and wet meadows.

Although the status of western snowy plover within the CMA is unknown due to inadequate survey effort, suitable habitat for the plovers does occur within the back dunes. In addition, it is possible that current restoration and European beachgrass eradication activities will increase open sand in the nearshore dunes near the project area and may improve the habitat for western snowy plover. The CMA Public Access Plan incorporates measures that will insure plovers are not adversely impacted by the proposed project, including the implementation of a snowy plover monitoring program and immediate coordination with USFWS for protecting any breeding plovers that may be discovered as a result of increased survey efforts.

Therefore, implementation of the proposed project is expected to have no impact on special status shorebirds.

Landbirds

Vaux's swift, yellow warbler, black-capped chickadee, purple martin, willow flycatcher, and bank swallow are known to occur or have the potential to occur within the CMA, primarily in association with the coniferous forest and freshwater/riparian swamp. Vaux's swift, yellow warbler, black-capped chickadee, and purple martin are California Species of Special Concern. Willow flycatcher is listed as endangered by the state of California and bank swallow is listed as threatened by the state of California.

Activities associated with the proposed actions that have the potential to adversely affect special status landbirds include:

- The ongoing potential for disturbance associated with routine vegetation clearing to maintain an open trail corridor through the CMA,
- The potential for disturbance to breeding birds associated with the expansion of the parking area at Ma-le'l North involving the removal of approximately eight young beach pines and the placement of crushed gravel,

Implementation of the following Mitigation Measure 2 would ensure that the Proposed Action, Alternative A, would not significantly impact or adversely affect raptors.

Aquatic birds

Three special status aquatic bird species are known to occur or have the potential for occurrence within the CMA. These include California brown pelican and double-crested cormorant, known to frequent beach habitat in the CMA, and elegant tern with a high potential for occurrence, especially along the bayshore at the northeastern edge of the CMA. California brown pelican is both federally and state listed as endangered and is a California Fully Protected species. Double-crested cormorant and elegant tern are both California Species of Special Concern.

No adverse impacts to special status aquatic birds are expected because the CMA does not contain suitable breeding habitat for California brown pelican (which nests offshore on coastal islands), double-crested cormorant (which nests on coastal cliffs, offshore islands and along lake margins within the interior of the state) or elegant tern (which is only known to breed in Sand Diego Bay, Los Angeles Harbor and Bolsa Chica Ecological Reserve).

Implementation of the proposed project is expected to have no impact on special status aquatic birds.

Mammals

Coastal coniferous forest within the CMA provides potentially suitable habitat for two special status mammals, white-footed vole and Sonoma tree vole. White-footed vole is a California Species of Special Concern. Sonoma tree vole is a Federal Species of Concern and California Species of Special Concern.

The proposed project will not remove any suitable coastal coniferous forest habitat and thus adverse impacts to special status mammals are not expected. Further, the proposed management of public use, including the installation of regulatory, boundary and directional trail signs, decommissioning of various casual trails currently in use, symbolic fencing and monitoring of compliance with allowable public use policy through caretaker presence, law enforcement patrols, and BLM/USFWS staff field visits, is expected to limit public access to the forested dunes, likely resulting in a net benefit to potentially occurring white-footed and Sonoma voles.

Adverse impacts to special status mammals are not expected since no potentially suitable habitat is to be removed and changes in public access are expected to result in a net benefit to the species. Implementation of the proposed project is expected to have no impact on special status mammals.

Alternative B: Multi-Use Throughout and Additional Improvements

The additional public uses associated with this alternative are likely to result in greater impacts to sensitive biological resources compared to the preferred action. In allowing off-leash dog walking in the nearshore dunes at Ma-le'l North, ground disturbance from foot traffic within sensitive habitat areas and disturbance to wildlife is likely to be greater since unleashed dogs are not as easily controlled or directed as leashed dogs, and pedestrians may find it necessary to venture outside of the trail corridor to retrieve wandering companions. Opening the northern portion of the nearshore dune/coastal trail (Latkak) on Ma-le'l South for equestrian use may similarly result in an increase in ground disturbance within the nearshore dunes by establishing a wider trail corridor to accommodate the horses. Extending the equestrian trail also reduces the buffer between existing equestrian use areas and sensitive habitat areas further north where this activity does not occur.

Connecting Ma-le'l South and Ma-le'l North with a pedestrian trail through the nearshore dunes would likely result in greater and less mitigatible impacts to endangered plant populations and native dune mat habitat as opposed to the proposed plan, which directs pedestrians to walk northward along the wave slope from the end of the coastal dune trail/Latkak Trail at Ma-le'l South to access the open dune trail (Ki'mak) at Ma-le'l North (or visa versa). By directing pedestrians to use the wave slope as opposed to the nearshore dunes, ground disturbance associated with foot traffic is diverted away from habitats that support endangered plant populations.

Alternative C: Protection and Restoration

The Protection and Restoration Alternative would limit public use throughout the entire Ma-le'l Dunes CMA to pedestrian use only with permit and via docent-led tours in order to protect natural and cultural resources.

No adverse impacts to federally listed species were identified under Alternative C. Limited public access allowed by special permit and via docent-led tours and field trips is expected to provide for the protection of biological resources by ensuring that visitors to the CMA avoid endangered plant populations and sensitive habitat areas. Limiting public access, along with continued management of the CMA through habitat restoration, is expected to benefit sensitive populations of rare, threatened and endangered plants and animals and natural communities more than the proposed plan. Impacts would be limited to those associated with routine maintenance of trail corridors. However, the implementation of Mitigation Measure 2 would ensure that Alternative C would not cause substantial impact or adverse affect to biological resources.

No Action Alternative (Alternative D)

In the No Action Alternative the current situation, as described in Site History and Current Uses of the public Access Plan, would continue and pedestrian trails and beach access through the nearshore dunes (where biological species of concern are present) would not be delineated or marked. Access to Ma-le'l North would continue to be limited to monthly walks and by special permit. In addition, pedestrian trails and beach access

throughout the nearshore dunes of Ma-le'l North would also remain undelineated and unmarked. Parking at the Pacific, Gas, and Electric power tower trail would continue to pose potential pedestrian – vehicular conflicts. The access road to Ma-le'l North and associated parking lot would not be improved and signage would not be installed. Trails through the forest and to beach access points would remain unmarked, unsigned, and in some cases, might pose risk to the public due to the dilapidated condition of trails, steps and rails and the wetland view deck. Remnant fence posts and wiring would continue to pose tripping hazards to the public.

The No Action Alternative would not address the Plan goal of providing public access to Ma-le'l North. Although USFWS would continue to manage for endangered plants within Ma-le'l North, threatened, endangered, and special status species may not be afforded the same protection because the signing program, fencing, decommissioning of casual trails, monitoring of compliance through caretaker presence proposed under Alternative A would not be implemented. Biological resources located within Ma-le'l South may also be less protected because of the lack of caretaker presence. Illegal entry to Ma-le'l North would continue to pose a potentially substantial threat to biological resources because unauthorized visitors would continue to use a vast network of casual trails throughout the Plan area. In addition, the No Action Alternative D would cause on-going minor impacts to native vegetation, breeding birds, herons and/or egrets, raptors and land birds due to routine vegetation clearing required to maintain an open corridor for open public access in Ma-le'l South, and permit and docent led entry in to Ma-le'l North.

3.5 Cultural Resources

This section describes the cultural resources within the Ma-le'l Dunes CMA properties.

Regulatory Setting

Under California law, cultural resources are protected by the California Environmental Quality Act (CEQA) as well as Public Resources Code Section 5024.1, which established the California Register of Historic Places. Section 5024.5 requires state agencies to provide notice, and to confer with State Historic Preservation Officer (SHPO) before altering, transferring, relocating, or demolishing state owned historic resources. To determine if a Plan or project would have significant impacts on cultural resources, CEQA applies a two part test; the resources must be "historically significant" and the would cause "substantial adverse change" to the resource (Bass et al 1999:103). In order to qualify as a historically significant, a resource must meet one of three qualifications[3]:

1. It can be listed in, or eligible for, the California Register of Historical Resources
2. It can be considered historically significant if it is listed in the local register or historic resources, or if it has been identified as significant in a cultural resources survey, or

[3] These guidelines are modeled on the National Register.

3. It can be considered significant if the Lead Agency responsible for CEQA/NEPA review determines it to be so, bases on substantial evidence in light of the whole record.

Likewise, the Section 3.18 Humboldt County General Plan, California Coastal Act, and Humboldt Bay Area Plan- Local Coastal Program requires any project activities that would impact archeological resources identified by SHPO to be reasonably mitigated for.

Under Federal law, cultural resources are protected by the National Historic Preservation Act as amended.

The Native American Graves Protection and Repatriation Act (NAGPRA) addresses the rights of lineal descendent, Indian Tribes, and Native Hawaiian organizations to Native American human remains and certain cultural items with which they are affiliated, and directs federal agencies and federally assisted museums to identify and repatriate the cultural affiliation of Native American human remains and related cultural items in holding or collections under their control.

Affected Environment

The proposed Ma-le'l Dunes CMA and Humboldt Bay with its north and south enclosing peninsulas is completely within the ethnographic territory of the Wiyot Indians and has been in use by people for over a thousand years. The Wiyot Indians were divided into three groups whose present descendants live in the area around Humboldt Bay; their are interests represented by Table Bluff Reservation - Wiyot Tribe, Bear River Band of Rohnerville Rancheria, and Blue Lake Rancheria.

The Ma-le'l Dunes CMA coastal and bay margin setting and its wide range of natural resources including flora, fauna, and fresh water, have made it attractive to human habitation. Cultural resources within the Plan area range from Wiyot village sites, camps, and activity areas to evidence of historic era settlements related to ranching, the timber industry, recreation, and environmental conservation efforts associated with coastal dunes habitat.

Archaeological and ethnographic investigations have taken place in the area of Ma-le'l Dunes from the early 1900's to the present (Coy, 1929; Elsasser, 1965; Elsasser, 1966; Elsasser, 1978; Elsasser and Heizer, 1966; USDI-BLM, 1976; Kroeber, 1925; USDI-BLM, 1988;USDI-BLM, 1991; USDI-BLM, 1992; USDI-BLM, 2004; Angeloff, et al, 2004). As a result of these research efforts, twelve (12) pre-Contact Wiyot and Old Nation use areas have been identified, several isolated stone tools have been found and recorded, and several historic places have been located within the Plan area.

Natural erosion, time, and recreational uses are the major adverse conditions affecting the prehistoric and historic cultural resources situated within the Ma-le'l Dunes CMA. Past impacts from off-highway vehicles in the foredunes have effaced, dispersed, and destroyed the fragile cultural activity areas located there. Archaeological test excavations at several of these sites have recovered scant information.

Consultation with the Wiyot Tribe of Table Bluff Reservation has resulted in the recognition of Ma-le-l Dunes as a place for gathering natural resources both for use as

part of their subsistence and for traditional cultural practices such as basket weaving. Extra care would be exercised in protecting the cultural resources from further damage and consultation with the Wiyot tribe should continue so access to traditional gathering areas are allowed and the Wiyot people can be more involved with their heritage.

Environmental Consequences

Alternative A: Proposed Plan

Public access trails to be delineated as per the proposed public Access Plan were routed around cultural resources with the assistance of the Wiyot Tribe Cultural Resources Specialist and in such a way to minimize resource impacts. Under the proposed Plan, casual trails to pre-historic resources of special interest to the Wiyot Tribe would be decommissioned and re-vegetated with native plants and/or brushed with vegetative materials. More foot traffic would be allowed near the cultural areas that could lead to adverse effects. On the positive side, the Wiyot people would have more access for traditional gathering and could be involved in monitoring and protecting their heritage values. The proposed presence of the public and a caretaker would deter vandalism at the sites.

The Plan proposes a public education and signing plan to be developed cooperatively by BLM and USFWS for the Ma-le'l Dunes that would foster appreciation and understanding, inspire stewardship, and convey management goals and regulatory restrictions relevant to the area. In addition, the joint logo to include both agency logos as well as a unifying design element, such as a Wiyot basket pattern, indicative of the cultural significance of the area would foster appreciation and respect of cultural resources. The main interpretive theme of the area, which is proposed to be: "The Ma-le'l Dunes is a culturally significant place to the Wiyot people who have a long history of habitation in the area and of making use of the area's diverse and abundant resources", the proposed trailside interpretive signs that would convey this message as well as several sub-themes, the proposed Wiyot trail names to be finalized with the consultation of the Wiyot Tribe, the proposed educational field trips to the area, and the proposed trail map/brochure containing interpretive information regarding the cultural values of the area and regulatory restrictions would further appreciation and respect of cultural resources within the Plan area.

Two dilapidated sheds associated with historic ranching in the area are not significant historic resources and would be dismantled under the proposed Plan. The remnants of the historic Hammond Lumber Company's railroad grade along the slough margin of the Plan area would be used as the proposed Ma-le'l Road and ADA access trail and erosion along the railroad berm would be addressed through a variety of erosion control measures such as placement of geotextile, fill, native planting and hard armoring.

The implementation of the following mitigation measures would ensure that Alternative A Proposed Action would not significantly impact or adversely affect cultural resources of the Plan area.

Mitigation Measure 7: In the event any undiscovered paleontological, archaeological, ethnic, or religious resources are encountered during grading or construction-related activities, in compliance with the state and federal law, all work within 100 feet of the resources shall be halted and the Plan applicants shall consult with a registered professional archaeologist and designated representative of the Wiyot Tribe to assess the significance of the find and formulate further mitigation. This would include coordination with the Native American Heritage Commission. The Native American Heritage Commission would contact the Wiyot Tribe, as deemed necessary, to assist in assessing the significance of any find. If any find is determined to be of significance, the USDI-BLM and FWS, and a qualified archaeologist would meet to determine the appropriate course of action. Pursuant to the California Health and Safety Code Section 7050.5, if human remains are encountered, all work would cease and the County coroner would be contacted. The county coroner and Native American Heritage Commission would be charged with determining if the human remains are of Native American origin.

Mitigation Measure 8: Cultural monitors will be present during initial, native soil disturbance activities that occur at locations mutually agreed upon by the Wiyot Tribe, USFWS, and BLM (as necessary) as areas of the greatest concern.

Mitigation Measure 9: Regulatory signing would state that in accordance to state law, destruction, and defacement of historical objects (Penal Code 655-1/2) and removal of human remains (PRC 5097.5 and PRC 70550.5) is a punishable crime. Undesignated canoe and kayak landings located on the slough and within the project boundary would be re-vegetated and signed "No Landing/Re-vegetation in Progress."

Mitigation Measure 10: USFWS, BLM (as necessary), and the Wiyot Tribe would work collaboratively with a registered professional archaeologist to prepare a baseline review of the cultural resources that the Tribe and agency staff mutually agrees upon as the areas of greatest concern. Thereafter annual review with a registered professional archaeologist or designated representative of the Wiyot Tribe would occur. Furthermore, Ma-le'l Dunes CMA managers would conduct regular monitoring to ensure against vandalism of cultural resources within mutually agreed upon areas of greatest concern. Results of cultural resources monitoring would be conveyed to the appropriate agencies.

Alternative B: Multi-use Throughout and Additional Improvements

The result of this alternative on cultural resources would be similar to Alternative A except heavier foot traffic throughout the CMA would be expected by the public, which could lead to substantial adverse impact on archaeological sites and traditional activity areas.

The implementation of mitigation measures 7 through 9 would ensure that Alternative B: Multi-Use Throughout would not substantially impact or adversely affect cultural resources of the Plan area. Additionally, mitigation measure 10 would ensure additional protection to the cultural resources of the Plan area.

Alternative C: Protection and Restoration

This alternative would isolate the cultural properties in Ma-le'l North and limit the access

in Ma-le'l South. This would likely result in cumulative adverse impacts to cultural resources as looters, vandals, and casual collectors would be able to conduct their nefarious activities in the absence of a watchful public.

The implementation of mitigation measures 7 through 9 would ensure that Alternative C: Protection and Restoration would not substantially impact or adversely affect cultural resources of the Plan area.

Alternative D: No Action

The No Action alternative would leave cultural resources and Native American concerns in a status quo situation. Natural erosion, illegal activities, existing trails, and conditions would continue and possibly accelerate. Native Americans would have difficulty in accessing the area for traditional purposes and would not be involved to any extent in the management of heritage values. The cumulative impacts of the No Action Alternative would be negative with cultural resources ultimately being adversely affected and possibly disappearing altogether over time.

3.6 Geology and Soils

This section describes the geology and soils of the Ma-le'l Dunes CMA properties.

Regulatory Setting

The California Coastal Act of 1976 developed policies to minimize laws protect life and property in areas of high geologic hazards. These policies require projects/plans to assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs or cliffs. [CA Coastal Act, Pub. Res. Code §30253]

Affected Environment

Geology

The Humboldt Bay Region and the Plan area is located within Seismic Hazard Zone 4 as defined by the Uniform Building Code (UBC) with four being the highest risk. The regional geography of the Humboldt Bay Area is characterized by the junction of the North American, Pacific, Gorda, and Juan de Fuca plates, which is a series of gently to steeply sloping uplifted marine terraces and northwest trending ridges dissected by moderately to deeply incised drainages in upland areas. Humboldt Bay Area is also in the Eureka Plain Hydrologic Unit, which lies within the Coast Range Geomorphic province. The Eureka Plain Hydrologic Unit is characterized by steep mountainous terrain underlain by older marine sediments, which are overlain by younger terrigenous and marine sediments and deeply incised drainages and valleys with modest amounts of alluvium.

This geological setting of the Humboldt Bay Area is characterized by formation of the basement rock of the Cretaceous Central Belt Franciscan Complex. The Central Belt Franciscan consists of broken and sheared sandstone, shale, and smaller amounts of chert, greenstone, serpentine and blueschist. Over the Franciscan formation lies the Tertiary Yager Formation, which consists of moderately well consolidated siltstone, sandstone, mudstone, silty shale, conglomerate and is highly sheared in some areas. The Mio-Pleistocene Wildcat Group overlies the Yager formation and consists of poorly to moderately indurated blue gray clayey siltstone with smaller amounts of sandstone, conglomerate, and thin volcanic ash beds that tends to coarsen upward. The Wildcat is massive to poorly bedded, folded, and compact. Overlying the Wildcat formation in the Quaternary Hookton Formation that consists of well-to-poorly sorted, gently folded nonindurated marine grading to nonmarine sands, silt, and gravel with rare fine volcanic ash beds. The Wildcat and Hookton Formations form the upland areas surrounding Humboldt Bay.

Geomorphology

The Ma-le'l Dunes CMA consists of a portion of the dune-slough ecosystem that comprises the upper Samoa Peninsula, or North Spit. The Samoa Peninsula is a roughly 20-mile sand spit that extends from the jetty to the mouth of the Mad River, effectively enclosing the northern portion of Humboldt Bay. The North Spit is a relatively mature dune system that contains a diversity of landforms. Typically, the dune system begins at the beach with a foredune, which is a ridge of sand parallel with the beach above the mean high tide. Behind the foredune is a series of dunes ridges and dune swales that are oriented parallel to prevailing wind direction, and/or a wide deflation plain at the base of the moving dunes. Collectively, the foredune, dune ridges, and dune swales are often referred to as the nearshore dunes. The deflation plain grades into large parabolic moving dune. Moving dunes end in a steep precipitation ridge where they abut older dunes stabilized by coniferous forest (Pickart, 1998). At the Ma-le’l North portion of the CMA stabilized, forested dunes descend towards the Mad River Slough marshes, mudflats and open channel (See Figure 8. Site Topographic Map).

Seismic Settings

The project area is located in area of high seismic hazards. The North Coast of California, consisting of the region from Cape Mendocino in Mendocino County to the Oregon border, is situated on the North American Plate. The project area is located in Humboldt County, which is situated seismically in the middle of this region. The Cape Mendocino region, located south of the project area, sits near the triple-junction of the North American, Gorda, and Pacific Plates. The Gorda Plate is a slab of oceanic crust being subducted underneath (thrust beneath) the North American Plate and extends north from Cape Mendocino to just north of the California-Oregon border. The juncture of these three plates makes the North Coast of California one of the most seismically active regions in the contiguous United States. Since 1983 the region has generated about 80, larger than 3.0 quakes each year, and historically the region has experienced major quakes.

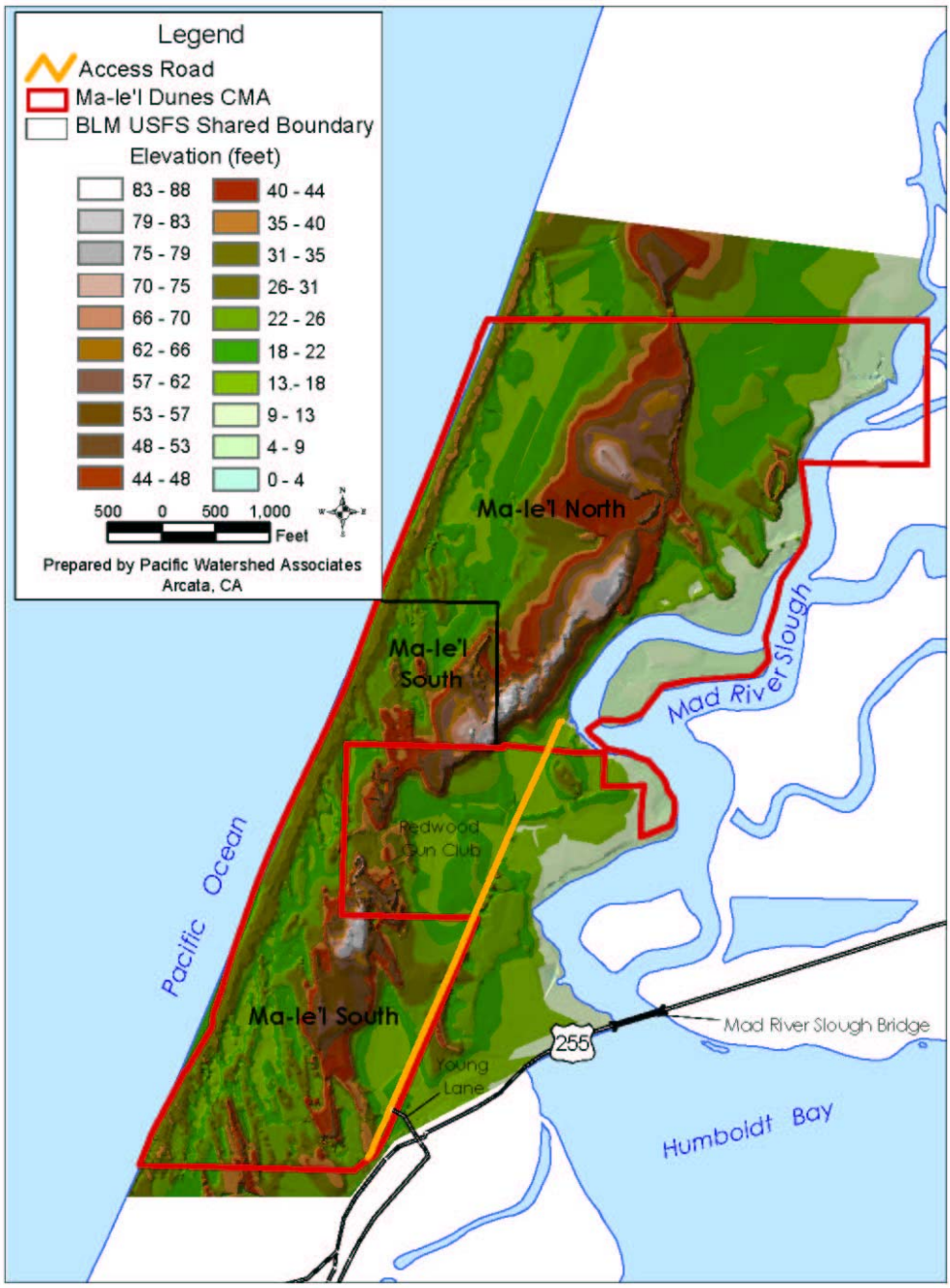

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Figure 8. Topographic Map of the Ma-le'l Dunes CMA

The Humboldt County is within Seismic Hazard Zone 4 as defined by the Uniform Building Code (UBC) with four being the highest risk zone. Development near active faults is regulated under the Alquist-Priolo Earthquake Fault Zoning Act (1972) in order to mitigate hazards related to surface fault rupture. Faults included in the act are considered active if paleoseismic evidence indicates movement in the fault within Holocene time (i.e. approximately the last 11,000 years).

Earthquake hazards include the potential for ground shaking, liquification, uplift or subsidence, and load-induced settlement and differential settlement. There are no known faults passing through the project area and no faults included within the States Alquist-Priolo Earthquake Fault Zones. However, faults may cause localized areas of the Humboldt Bay region to experience uplift or subsidence. Studies at Clam Beach (Clarke and Carver, 1992), approximately 10 miles north of the project area indicate that two episodes of uplift, probably related to earthquakes on the Cascadia Subduction Zone and/or the North American Plate, have raised the beach area at least nine feet during each episode. Evidence suggests that the Mad River Slough has experienced episodes of subsidence that may also coincide with Cascadia Subduction Zone and/or North American Plate earthquakes (Vick, 1988). Impacts are unpredictable due to the variable nature of seismic episodes.

Environmental Consequences

Alternative A: The Proposed Plan

The Proposed Plan includes very few structures that have the potential to cause property damage or loss of human life. The only proposed upright structures other than the occasional kiosk and low fencing is a vault toilet, and two viewing decks.

The potential for property damage and loss of human life associated with seismic events would be less than substantial with the proper engineering of the proposed structures. Engineering of the proposed structures would be constructed to comply with Zone 4 requirements using the latest edition of the California Building Code (CBC). The vault toilet at the Ma-le'l north parking area would consist of one stall, 1,000-gallon vault capacity, and ADA accessible. The toilet would be prefabricated and would already be engineered to withstand seismic events. Additionally, the Plan area is not located on any known earthquake faults.

The Plan area is in an area is subject to landslides due to the nature of moving sand dunes, which have large elevation changes. Additionally, soils are susceptible to soil erosion and general instability. The proposed Plan would not result in the loss of topsoil or cause substantial soil erosion due to the fact that most trails outlined in the access Plan consist of existing trails and casual trails that would be re-vegetated. All new trails would be designed to prevent loss of topsoil and soil erosion and proposed infrastructure would not be built on soils that are susceptible to landslide or have large elevation changes.

One existing trail, the railroad berm trail, which is located adjacent to the Mad River Slough has some soil erosion. Erosion control methods along the railroad berm trail are addressed in the Access Plan.

Alternative B: Multi Use Throughout and Additional Improvements

Under Alternative B the risks associated with seismic events to the proposed structures and human life would be the same as Alternative A: The Proposed Plan. Additionally, all structures would be engineered to comply with Zone 4 requirements using the latest edition of the California Building Code (CBC). However, Alternative B could contribute to additional erosion or landslides to the Ma-le'l CMA associated with the pedestrian trail connecting Ma-le'l South and Ma-le'l North along the nearshore dunes, the off trail vegetative gathering, and the off trail usage throughout Ma-le'l South. The proposed pedestrian trail would be designed to prevent the loss of topsoil and soil erosion and would be located in areas that would not be susceptible to landslide or have large elevation changes. The proposed off trail vegetative gathering and pedestrian use could potentially cause casual trails to form throughout the Ma-le'l South. Casual trails could cause substantial soil erosion to occur due to the fact that much of the soil and topography in the CMA is subject to landslides, general instability, and large elevation changes.

Alternative C: Protection and Restoration

Alternative C: Protection and Restoration includes very few structures that have the potential to cause property damage or loss of human life. The only proposed upright structure is the wetland viewdeck. This structure will be engineered to conform with Zone 4 requirements using the latest edition of the California Building Code (CBC).

Additionally, Alternative C would potentially reduce the soil erosion within the Ma-le'l CMA due to the fact that equestrian and dog use would not be allowed on trails and new pedestrian trails would not be open to the public. However, Alternative C would not address erosion control along the railroad berm trail.

Alternative D: No Action

The No Action Alternative would expose people to the hazards associated with seismic events including ground shaking and liquefaction. However, the No Action Alternative would not construct any structures that could pose a hazard to human life during a seismic event.

The No Action Alternative would be subject to landslides, as discussed under Alternative A. However, the No Action Alternative could possibly result in additional loss of topsoil or soil erosion in the Plan area because no erosion control methods or trail maintenance would be conducted. For instance, existing trails such as the Railroad berm trail, which suffers from soil erosion in some locations, would continue to erode with the continued occasional use of the trail. In addition, other existing trails could begin to suffer from more significant soil erosion and loss of topsoil without the erosion control and re-vegetation plans proposed in the Access Plan.

3.7 Hazards and Hazardous Materials

This section describes the hazards and hazardous materials of the Ma-le'l Dunes CMA properties.

Regulatory Environment

Hazardous materials are regulated by many state, federal, and local laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health and land use. These state and federal laws include:

- Resource Conversation and Recovery Act of 1976 (RCRA)
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980
- Community Environmental Response Facilitation Act of 1992
- Clean Air Act
- Clean Water Act
- Safe Drinking Water Act
- Occupational Safety and Health Act
- Toxic Substances Control Act
- California Health and Safety Code
- CEQA
- NEPA
- County of Humboldt General Plan
- Humboldt Bay Area Plan-Local Coastal Program
- Humboldt Bay Management Draft Plan

Affected Environment

The Ma-le'l Dunes CMA does not contain any significant amounts of hazardous materials or contaminates that are adversely affecting the Plan site. This was determined after a Targeted Brownfields Phase 1 Assessment Report was performed throughout the Plan Site. The report conducted site visits, record reviews of agencies, and database searches. The Phase 1 report concluded that there were no hazardous materials located on the site; however, the former Buggy Club parcel located in Ma-le'l South contain a few buried cars littered throughout the property. The existence of the buried cars resulted in BLM conducting additional soil and groundwater sampling of the affected area. These tests concluded that the groundwater contaminant levels were below maximum contaminant levels and that soil samples were below EPA preliminary remediation goals for residential soils. No further testing on the site has been completed to date. Additionally, the Ma-le'l CMA does not contain any commercial/or private airstrips within the vicinity of the Plan area.

The Ma-le'l CMA is located within the Humboldt and Del Norte Counties 1995 Planning Scenario areas likely to be impacted from the event of a tsunami. Geologic history indicates that the regional geography of the Plan area is susceptible to locally generated tsunamis and tsunamis generated by transoceanic events. Local evidence of paleoseismic

and paleotsunami activity near the project area was collected along the Samoa Peninsula and the surrounding Humboldt Bay area. Local evidence was collected through a series of three studies completed by Vick (1988), Jacoby et al. (1995), and Leroy (1999). Local paleoseismic evidence was collected in the buried wetlands of Mad River Slough area (Vick, 1988 and Jacoby et al., 1995). Investigations identified zones where local coseismic (accompanying an earthquake) subsidence has occurred. The investigations determined that the Samoa Peninsula was has not been overtopped by a tsunami. This was determined after investigations indicated that there was not a clean sand layer at the base of the younger wetland deposits and overlying older, buried wetland deposits adjacent to the forested dunes along the Samoa Peninsula. Leroy (1999) interprets that the older dune sequences were of sufficient elevation to have prevented overtopping. The older dune sequences are located in the northern and central portion of the Samoa Peninsula. The older dunes are typically forested, with maximum elevations of about 90 feet (21 m) above mean low sea level. Leroy reports of paleotsunami evidence of overtopping in the dune complex in localized areas of the Samoa Peninsula, along the low-lying areas in the Humboldt Bay area, adjacent to the South Spit were overtopped by a tsunami. The average elevations of the dunes overtopped by a tsunami were an average of about 15 feet (approximately 4.5 m) and a maximum elevation of about 20 feet (approximately 6 m). The present height of the tallest foredunes at the Ma-l'el CMA is a approximately 90 ft.

The Ma-le'l CMA nearshore dune complexes directly facing the Pacific Ocean have a high susceptibility to be directly affected by a tsunami. The remaining areas have a lower probability of being directly affected by tsunami hazards. The nearshore dunes of the Ma-le'l CMA would be directly affected by the primary/direct affects of a tsunami, which includes flooding from high water, buoyant forces, liquefaction of near-surface soils. The secondary/indirect effects of tsunami consist of impact by water-borne debris, fire and access disruption.

The Redwood Gun Club (RGC) is non-profit, public firing range facility that owns approximately 45 acres adjoining the Ma-le'l Dunes CMA and maintains deeded access along the access road (Ma-le'l Road), which is owned by USFWS. The firing range is open to local community members on Saturdays and Sundays 10 a.m. to 4 p.m. and is used occasionally during weekdays by local law enforcement teams. RGC serves as venue to learn proper firearms handling, hunter safety, firearms marksmanship, and practice the various competitive shooting disciplines. RGC has a long history of consistent management, rules are strictly enforced, and safety is paramount. Two firing areas (one long range and one short range) exist near the center of the property within a bowl shaped dune formation. The firing ranges within the property are clearly delineated with prolific signing; the firing areas are devoid of standing vegetation but surrounded by impenetrable riparian wetland thickets. Antiquated signing for RGC is located near the Pacific, Gas, and Electric power tower (near the foot of the Ma-le'l access road) and outside the nearby, currently locked gate. The property has an entrance gate (located along Ma-le'l Road) but signing at the entrance is absent; post and wire fencing exists in reasonable condition around the property perimeter and where fencing is sparse, the property is impenetrable due to riparian wetland thickets. "Do Not Enter" signs are posted within sight distance apart on the fencing along the Ma-le'l Road and along the western boundary, and intermittently in other locations along the property line.

Environmental Consequences

Alternative A: Proposed Plan

Hazardous Materials

The proposed Plan would not expose people or the environment to any long-term risks associated with hazardous materials or emission of hazardous materials. The proposed Plan would require the handling of minimal amounts of hazardous materials during construction of the proposed projects. Typical construction-related materials, such as fuels and oils, would be used during construction. Construction workers may therefore be exposed to dust or emissions containing these materials. Standard construction procedures would be implemented to reduce the emissions of dust or other pollutants during the proposed Plan. If potentially contaminated areas are encountered during construction qualified personnel would evaluate the area in the context of applicable local, state, and federal regulations governing hazardous waste. Handling and storage of fuels, flammable materials, and common construction-related hazardous materials are governed by California Occupational Safety and Health Administration (Cal/OHSA) standards for storage and fire prevention. The impact from temporary construction related hazards are considered minor.

Hazards from Airstrips

The proposed Plan would not result in a safety hazard to people associated with airstrips due to the fact that the Plan area is not located near an airstrip. Additionally, the proposed Plan would not impair emergency response to the area because the construction-related activities would be located off the primary road network.

Hazards from Wildland Fires and Tsunamis

The proposed Plan would not expose people or structures to a risk of wildland fires because the Plan area does not contain nearby urbanized areas or flammable wildlands. Any potential increase in fire hazards due to construction activities at the Plan site would be minimized because construction staff would adhere to all rules and regulations regarding the handling and storage of fuels and flammable materials.

The proposed Plan would expose people to the risks associated with the event of a tsunami. The event of tsunami would primarily affect people that would be located on the nearshore dune complexes directly facing the Pacific Ocean. A tsunami striking other areas in the Ma-le'l CMA would have to overtop the approximate 90ft elevations of the dune complexes. Evacuation from the project site is the only viable means for protecting human life. The nearest point above the likely tsunami flooding level is the top of the nearshore dunes which, at 90ft appear to represent a reasonable protection from tsunami inundation. There is currently a plan to prepare a tsunami response plan that will include the project area. This plan will be prepared in conjunction with the office of Emergency Services to develop a response plan that would address the style and location of tsunami signing and posting for specific evacuation routes, as well as integrate the caretaker into

evacuation activities. The Ma-le'l Dunes CMA Access Plan includes as a part of the project signage for visitor information including public safety and tsunami warnings. These signs will be installed at main parking lot kiosks as a planned element of the project, and will be revised and/or replaced to be consistent with a tsunami response plan, when it is complete.

Hazards from Proximity to Firearms Range

The proposed Plan would not expose people to the risk of firearms associated with the Redwood Gun Club because the area where firing occurs is small and centrally located relative to the total area of the property, firing occurs more than 400 feet from the entrance of the RGC and more than 1000 feet from other property lines, access to the property is limited by fencing, high dunes, and/or dense wetland vegetation, and rules at the club are strictly enforced. Furthermore, access to the two on-site firing ranges within the property is limited by dense wetland vegetation and signing near the firing ranges is prolific. The two firing ranges are located in a large bowl shaped dune with high ridges, which although surrounded by dense vegetation, is devoid of standing vegetation that provides clear sight distance. The long range firing area extends across low laying swampy area that is inaccessible and ends at the side of a dune, which is in turn surrounded by a large a riparian swamp. The short range firing area has targets also backed by a dune and large riparian swamp. In addition, the proposed Plan stipulates that additional signing be placed at RGC entrances and along property boundaries and that information about RGC be included at kiosks and in interpretive brochures. For these reasons, bullets from the long or short firing ranges would not stray into area of the Ma-le'l Dunes CMA property. Furthermore, visitors to the Ma-le'l Dunes CMA would not be able to wander unaware onto the site and be exposed to the risk of firearms.

Alternative B: Multi-use Throughout and Additional Improvements

Hazardous Materials

The potential impacts associated with hazardous materials would be essentially the same as Alternative A. However, Alternative B would expose people to additional short-term hazards associated with construction activities, especially during the paving of the access road. These additional impacts are considered minor.

Hazards from Airstrips

The hazards associated with airstrips will be the same as described in Alternative A.

Hazards from Wildland Fires and Tsunamis

The hazards from wildland fires will be the same as described in Alternative A. Alternative B will expose additional people to the risks associated with tsunamis due to the proposed delineated trail from Ma-le'l South to Ma-le'l North along the nearshore dune complex. Evacuation from the project site is still a viable mitigation measure to protect human life. The nearest point above the likely tsunami flooding level is the top of the nearshore dunes. Signage at the parking areas would address all safety requirements for the risks associated with a tsunami.

Hazards from Proximity to Firearms Range

The hazards associated with the proximity to a firearms range would be the same as described in Alternative A.

Alternative C: Protection and Restoration

Hazardous Materials

Alternative C would not expose people to long term or short term hazardous because there would be no construction activities and there are no hazardous materials located within the project site.

Hazards from Airstrips

The hazards associated with airstrips will be the same as described in Alternative A.

Hazards from Wildland Fires and Tsunamis

The hazards associated with wildland fires and tsunamis will be the same as described in Alternative A.

Hazards from Proximity to Firearms Range

Alternative C would not expose people to risks associated with the proximity of a firing area because of those reasons described in Alternative A. In addition, visitors to Ma-le'l North would not be exposed to such risks because they would enter Ma-le'l Road and the Ma-le'l North area only with a docent or guide.

Alternative D: No Action

Hazardous Materials

The No Action Alternative would not expose people to long term or short term hazardous materials because there would be no construction activities and there are no hazardous materials located within the project site.

Hazards from Airstrips

The hazards associated with airstrips would be the same as described in Alternative A.

Hazards from Wildland Fires and Tsunamis

The hazards associated with wildland fires and tsunamis would be the same as described in Alternative A.

Hazards from Proximity to Firearms Range

Although signing would not be improved and educational information not provided to visitors under Alternative D, people would not be exposed to risks associated with the proximity of a firing area because of the existing conditions of the site described under Alternative A. Furthermore, visitors to area would not be exposed to risk because they would enter Ma-le'l Road and the Ma-le'l North area only with a docent or guide.

3.8 Hydrology & Water Quality

This section describes the current hydrology and water quality of the Ma-le'l Dunes CMA properties.

Regulatory Setting

The primary federal law regulating "waters of the United States" and "wetlands" is the U.S. Environmental Protection Agencies Code of Federal Regulations (CFR) (40 CFR 122.2(a) through (g)). Because wetlands and creeks are included under this definition of waters of the United States, their water quality must be protected to meet the mandate of the Clean Water Act articulated in section 101(a), "to restore and maintain the chemical, physical, and biological integrity of the nation's waters." The protection and enhancement of water quality must address not only the water chemistry, but also the multiple elements, including aquatic life, wildlife, habitat, vegetation, and hydrology, that together make up aquatic systems. Therefore, relevant issues to address with respect to wetlands and creek protection can include the toxicity and bioaccumulation of pollutants, entrapment of pollutants in sediment, and hydrologic changes (U.S. EPA, 1996).

Due to the fact that the Plan area is located within a floodplain the Federal Emergency Management Agency (FEMA) is the federal agency charged with regulating and implementing policies related to the National Flood Insurance Program (NFIP) as well as providing guidance floodplain management and the protection of wetlands. The Floodplain Management and Protection of Wetlands section of the Federal Code of Regulations (44 CFR Section 9.2) states that it is FEMA's environmental review policy to:

1. Avoid long- and short-term adverse impacts associated with the occupancy and modification of floodplains and the destruction and modification of wetlands;

2. Avoid direct and indirect support of floodplain development and new construction in wetlands wherever there is a practicable alternative;

3. Reduce the risk of flood loss;

4. Promote the use of nonstructural flood protection methods to reduce flood loss risk;

5. Minimize the impact of floods on human health, safety and welfare;

6. Minimize the destruction, loss or degradation of wetlands;

7. Restore and preserve the natural and beneficial values served by floodplains;

8. Preserve and enhance the 'natural' values of wetlands.

The California Coastal Act protects the biological productivity and quality of coastal waters, streams, wetlands, and estuaries and lakes and maintains the optimum populations of biological organisms (Policy # 30231). To protect biological productivity of these waters adverse affects from waste water discharges shall be minimized, control runoff, prevent depletion of ground water supplies and substantial interference surface water flows, maintain natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

The North Coast Regional Water Quality Control Board (NCRWQCB) also has jurisdiction over the Plan area. The Basin Plan (composed by the NCRWQCB) includes a *Water Quality Control Plan for the Enclosed Bays and Estuaries of California*, and a specific *Action Plan for Humboldt Bay* (Water Quality Control Plan for the North Coast, 1996). The *Action Plan for Humboldt Bay* requires surveillance and monitoring; review and assessment of land use activities; and Regional Board coordination with other state and local agencies with regard to protecting water quality in Humboldt Bay. In order to assure protection of waters in Humboldt Bay, the Regional Board closely monitors construction and industrial activities that could potentially impact water quality.

The basic strategy adopted in the Basin Plan is to prohibit uses and activities that would degrade the "beneficial uses" designated for waters covered by the Plan. Each major hydrologic unit has a specific listing of designated beneficial uses in the Basin Plan. The following are beneficial uses of Humboldt Bay, the Pacific Ocean, and area groundwater (NCRWQCB, 1993).

The beneficial uses of Humboldt Bay include:

- industrial service supply
- navigation
- water contact recreation
- non-contact water recreation
- commercial and sport fishing
- wildlife habitat
- preservation of rare, threatened or endangered species
- marine habitat
- migration of aquatic organisms
- spawning, reproduction, and/or early development of fish
- shellfish harvesting
- estuarine habitat

Furthermore, the Humboldt County General Plan has policies regarding hydrology and water quality (*Policies # 3361.1, 3361.2, and 4235.2*). The general plan policies ensure that the long-term values of water resources in Humboldt County are protected. Therefore, all natural drainage ways shall be utilized consistent with the streamside management policies. Humboldt County also participates in the Federal Flood Insurance

Program to regulate land uses in flood hazard areas in order to minimize loss of life and property, and in order to minimize public flood-related expense.

Affected Environment

The Plan area is located on the North Spit of Humboldt Bay (also known as the Samoa Peninsula) with the Mad River Slough and Humboldt Bay lying to the east and the Pacific Ocean lying directly to the west. Humboldt Bay is the dominant water body in the project area. Several large creeks and Elk River discharge into Humboldt Bay, and during the rainy season the creeks and Elk River contribute urban and industrial runoff, as well as significant amounts of sediment. Water quality in Humboldt Bay is influenced by storm water runoff from urban and industrial development, discharges of treated wastewater effluent farming, timber harvesting, and natural areas that surround the bay as well as the creeks and Elk River.

The hydrogeologic conditions around the bay are characterized by the nearshore geology that includes varying soil types consisting of bay mud, peat, silts, sands, and gravel. Groundwater quantity and quality in the area surrounding Humboldt Bay is influenced by the soil conditions that provide low yield rates and contain high amounts of soluble minerals. Additionally, depending on the proximity to Humboldt Bay, groundwater quality may be impacted by high levels of salinity. For these reasons, there is limited development of groundwater around the margin of Humboldt Bay for domestic or industrial purposes.

Hydrology

Hydrology in the project area is influenced by Pacific Ocean weather patterns and the Humboldt Bay watershed. Average annual rainfall for the area is approximately 38 inches per year, which is concentrated between the months of October and March. In some years, additional significant rainfall occurs through April. During the remainder of the year, coastal marine influences result in fog that at times is dense enough to generate moisture in the form of mist.

There are approximately 105 acres of identified wetland areas within the Plan boundaries. Two seasonal dune wetlands totaling approximately 50 acres are located within the project in the nearshore dune area on Ma-le'l North. Two human induced wetlands of approximately 15 acres in size are also located on the Ma-le'l North property. These wetlands were altered by the construction of the former railroad berm, which impounded water on the western side of the berm. Salt and associated brackish marsh area along Mad River Slough is approximately 40 acres. See Table 5 for a summary of wetland areas. A detailed account and analysis of the wetland areas within the Plan area can be found in the biological section of this document.

A spring fed freshwater creek, named Iron Creek exists on the most northern portion of Ma-le'l North. Another freshwater spring is located next to the Ma-le'l North parking lot. There are no other significant year-round creeks, rivers, lakes, ponds, or other bodies of water within the project area. There is currently erosion at many locations along the railroad berm adjacent to the Mad River Slough.

Table 5. Summary of Wetland Areas at Ma-le'l Dunes CMA

Wetland Area	Location	Area	Dominant Water Source
Seasonally Flooded Freshwater Wetlands	Dune swales	50 acres	Groundwater
Freshwater Swamp/ Riparian	West of access road, which the former railroad berm. Northern portion of Ma-le'l North	15 acres	Groundwater
Brackish Marsh	Transition from upland to salt marsh of Mad River Slough	5 acres	Groundwater, streamflow, and bay water
Salt Marsh	Mad River Slough	35 acres	Bay water
Total wetland area:	105 acres		

Topography

Elevations within the proposed project area range from approximately 0 feet above mean sea level (MSL) at ocean and slough areas of the property, to more than 80 feet above MSL in some of the dune areas. A topographic and drainage map is provided in Figure 8. Some areas within the property have been developed, altering the original topography by cutting and filling at various locations. The most distinct of these features is the remnant railroad grade that is the current location of the access road. However, many areas such as the Gun Club and the south parking lot areas have been extensively graded.

Drainage and Surface Waters

Stormwater runoff from the site flows east to Mad River Slough then into Humboldt Bay, or onto a freshwater lens above the salt water table. With the exception of some compacted gravel parking areas and roads the project area generally has very high infiltration capacities due to the highly permeable dune soils.

Surface water resources in the project area consist of wetland areas of varying types and values, all of which exhibited evidence of standing water during the 2002/2003 winter season. Some wetland areas appear to be natural while other wetlands appear to have been created by impoundment of areas by remnant railroad fill.

Flooding

According to the FEMA FIRM map, portions of the project site are located within the Zone A 100 year flood plain. However, there are no known records regarding past flooding of the Plan area exclusively due to storm flows, extreme high tides or rainstorms coincident with high bay tides.

Water Quality

Surface Water

Impurities in the local surface runoff, shallow groundwater, and atmospheric deposition influence surface water quality in the Plan area. The quality of adjacent Humboldt Bay tidal waters is also dependent on such significant hydrologic and biological parameters as the timing and magnitude of freshwater outflow, complex circulation patterns in the bay, wind-driven mixing and re-suspension of fine-grained sediments, time-varying salinity gradients and water temperature, and nutrient loading. Water quality in the Pacific Ocean is dependent on a number of regional and global factors, including climate and weather changes, currents and upwelling, and seasonal output from local rivers and estuaries.

Contaminants carried by stormwater runoff derive from point or non-point sources. Point sources include easily verifiable discharge points such as sewage treatment plants, industrial outfalls, and marinas. Non-point sources represent diffused contamination over wider areas, including cultivated, agricultural, and urbanized lands. Typical contaminants in such non-point source urban runoff include heavy metals (e.g. mercury, lead, zinc, copper, chromium, nickel), nutrients, pesticides and herbicides, PCBs and related compounds, sediments, and oil and grease.

Contamination of surface and groundwater has been identified at the Sierra Pacific Industries (SPI) Arcata Division Sawmill, which is adjacent to the Plan area. The use of pentachlorophenol (PCP) and tetrachlorophenol (TCP) containing anti-stain/anti-fungus solution were used at the site from the early 1960's to until September 1987 and the storage of oil in an underground storage tank until the 1970's are sources of significant contamination. On October 31, 2001, a Cleanup and Abatement Order was issued to SPI by the NRCWQCB. Since then groundwater monitoring and remediation has been taking place, with the most recent progress report released in March 2005. In 2002, prior to funding the acquisition of the Ma-le'l project area by the Center for Natural Lands Management, the SCC performed a Phase I Site Assessment. The Phase I determined that contamination from the Sierra Pacific site did not pose a threat to the Ma-le'l project area.

BMPs are practices implemented to control the generation and delivery of pollutants from land use activities to water resources, thereby reducing the amount of pollutants entering surface and ground waters.

Within the caretaker's area there is a septic tank and leach field designed to accommodate the trailer that was located there in the past.

Groundwater

With the Plan area adjacent to the tidal zone and in close proximity to saline water, the underlying near-surface groundwater does not likely represent a significant potential resource. Groundwater quality sampling has not been performed to confirm this assumption. HBMWD currently provides water to the caretaker's residence within the site.

Local groundwater seepage from past adjacent industrial uses affects groundwater quality in the Plan area. Because the local geology is very permeable, groundwater

contamination could be extensive and/or very dilute due to many years of rain and tidal flushing. Some local houses to the north and south have wells

Environmental Consequences

Alternative A: Proposed Plan

Impacts of the proposed action alternative are generally associated with construction and are expected to be temporary. The replacement of the wetland viewing deck and construction of the canoe and kayak landing and launching ramp would potentially disturb water quality on a temporary basis. Additionally, construction of the erosion control revetment along the Railroad berm trail could possibly impact water quality due to its vicinity to the Mad River Slough. All construction activities possibly affecting water quality would be mitigated to a less than significant amount through the use of California Stormwater Quality Association's Stormwater Best Management Practice (BMP) Handbooks. Construction of the pedestrian footbridge over a seasonal wetland would take place during the dry season thereby avoiding impacts to water quality.

Typical stormwater pollutants from parking lots are hydrocarbons and metals. In gravel parking lots the constituents are typically adsorbed and sequestered within the gravel media and therefore pose little potential risk to downstream receptors. Expansion of the Ma-le'l North parking area would be constructed using gravel, which is semi-permeable. Soil in the vicinity of the site is highly permeable. The design would include best management practices proposed in the Plan that would reduce erosion and non-point source pollution, and that meet the design guidelines and performance criteria of the California Stormwater Quality Association's Stormwater Best Management Practice (BMP) Handbooks.

The implementation of the Plan would require that a number of permits be acquired before the projects of the Plan can begin construction. These permits will include a NCRWQCB Section 401 Water quality certification, USACE Section 10 and Section 404 permit for filling or dredging of water of the United States, Humboldt Bay Harbor, Recreation and Conservation District encroachment permit for projects in tidelands below Mean High Water Elevations, California Coastal Commission Section 307 permit for projects located within the Coastal Zone, and State Water Resources Board General Construction Water Discharge Requirements for construction activities covering over one acre.

The implementation of the following mitigation measure and Best Management Practice’s would ensure that Alternative A: Proposed Action would mitigate the potential impacts to water quality to a negligible level.

Mitigation Measure 1:

Planned improvements would occur during the dry season in seasonal wetlands and would incorporate Best Management Practices (BMPs) to control sediment transport, such as conducting work during low tide, and use of silt fencing if necessary.

Alternative B: Multi-use Throughout and Additional Improvements

Alternative B includes paved access road and parking lots. This would increase runoff into ditches and vegetated area or directly in to adjacent wetlands. Due to high infiltration rates of the soils surrounding the parking areas it is unlikely that runoff form these areas will directly flow into the surrounding wetlands. Hydrocarbons and metals and other stormwater related pollutants would be sequestered in the soils. Ditches drain much of the access road and storm flows, which will increase if the road is paved. Also, in areas where the road borders wetlands there is no room for drainage structures so small amounts of runoff will flow directly from the road to adjacent wetlands.

With appropriate stormwater design, impacts would be negligible . A site-specific SWPPP will be developed and implemented that will identify the measures that will be taken to prevent storm water pollution caused by development and construction activities. In addition, similarly like Alternative A, any design will include best management practices that reduce erosion and non-point source pollution, and that meet the design guidelines and performance criteria of the California Stormwater Quality Association's Stormwater BMP Handbooks.

Alternative C: Protection and Restoration

Hydrology and water quality will be similar to that to Alternative A: The Proposed Plan. However, Alternative C will have less automobile traffic and thus reduce the potential impacts from polluted runoff .

Alternative D: No Action

Alternative D: The No Action alternative would not cause any adverse impacts to the water quality of the Ma-le'l CMA due to the fact that there would be no construction activities under the No Action alternative. Additionally, there would not be an increase in stormwater pollutants from parking lots because the Ma-le'l North parking lot would not be open to the public. The Ma-le'l South parking lot consists of a gravel constituent that typically adsorbs and sequesters pollutants within the gravel media and poses little potential risk to downstream receptors.

3.9 Land Use and Planning

This section describes the land use designations and planning of the Ma-le'l Dunes CMA properties.

Regulatory Setting

The BLM portion of the CMA is subject to general land use objectives and allocations contained in the 1995 Samoa Peninsula Management Area Resource Management Plan Amendment and 1989 Arcata Resource Area Management Plan.

The Coastal Zone Management Act of 1972 (CZMA) is the primary federal law enacted to preserve and protect coastal resources. The CZMA sets up a program under which coastal states are encouraged to develop coastal management programs. States with an approved coastal management Plan are able to review federal permits and activities to determine if they are consistent with the state's management plan.

California has developed a coastal zone management plan and has enacted its own law, the California Coastal Act of 1976, to protect the coastline. The policies established by the California Coastal Act are similar to those for the CZMA; they include the protection and expansion of public access and recreation, the protection, enhancement and restoration of environmentally sensitive areas, the protection of scenic beauty, and the protection of property and life from coastal hazards. The California Coastal Commission is responsible for implementation and oversight under the California Coastal Act.

The Humboldt County General Plan Volume II, Humboldt Bay Area Plan of Humboldt County Local Coastal Program (Humboldt Bay Area Plan) has primary jurisdiction over the Plan area for its land use designation and allowable uses. The Humboldt Bay Area Plan land use designation for the Plan area is natural resources with the purpose being to protect and enhance valuable fish and wildlife habitats, and provide for public and private use of their resources, including hunting, fishing and other forms of recreation. The principal use of natural resource areas is for management for fish and wildlife habitats. Additionally, the Humboldt Bay Area Plan policies and standards for areas zoned natural resources include policies for the protection of marine resources, coastal streams, riparian vegetation, wetlands, and beach and dune habitats (Policies 3.30 B 1-13). Furthermore, the Humboldt Bay Area Plan policy 3.30-11 (b) encourages beach and dune area be purchased by agencies that would be committed to preserving the area in its' natural state as well as provide public understanding of coastal dune ecology.

Additionally, the zoning of the Plan area is under the jurisdiction of the Humboldt County Zoning Regulations. The Humboldt County Zoning Regulations have additional codes and regulations that the Plan must follow for parcels zoned natural resources and coastal. Additionally, the natural resource use types set by the zoning regulations are fish and wildlife management, coastal public access facilities, boating facilities, resource related recreation, watershed management, and wetland restoration.

The Plan area is included in the Recovery Unit 1 of the western snowy plover Pacific Coast Population Draft Recovery Plan (2001), and the recovery Plan for seven coastal plants and the Myrtle's silverspot butterfly (1998). The western snowy plover Pacific Coast Population Draft Recovery Plan (2001) includes plans, policies, and permitting requirements for all projects, plans, and activities that take place within the Recovery Plan Area.

Affected Environment

The Ma-le'l Dunes Cooperative Management Area (Ma-l'el CMA) is designated and zoned Natural Resources (NR) under the jurisdiction of the Humboldt County General Plan Volume II, Humboldt Bay Area Plan of Humboldt County Local Coastal Program and the Humboldt County Zoning Regulations. Additionally, the Plan area is located in the coastal zone and is regulated by the California Coastal Act.

The Plan area is included in the Recovery Unit 1 of the western snowy plover Pacific Coast Population Draft Recovery Plan (2001), and the recovery Plan for seven coastal plants and the Myrtle's silverspot butterfly (1998).

Environmental Consequences

Alternative A: Proposed Plan

The Ma-le'l CMA Plan would not conflict with any land use regulations, zonings, or plans adopted to avoid or mitigate environmental affects. Additionally, the Plan would not divide any existing communities.

The Plan would not conflict with any habitat conservation plans or natural community conservation plans if permits are acquired that will comply with the requirements of the Recovery Unit 1 of the western snowy plover Pacific Coast Population Draft Recovery Plan (2001) and the recovery Plan for seven coastal plants and the Myrtle's silverspot butterfly (1998). These permits would include the United States Fish and Wildlife Service/ National Marine Fisheries Service Section 7 Consultation for the Biological Assessment, National Marine Fisheries Service Section 305 Consultation concurrent with Section 7, United States Fish and Wildlife Service Federal Migratory Bird Treaty Act consultation; and the California Department of Fish and Game Section 2080 consultation for species that are federally protected, Fish & Game Code Sections 3511, 4700, 5050 and 5515 for fully protected animals consultation, and Fish & Game Code Sections 3503 and 3503.5 Bird Nest Protection such as osprey consultation.

Alternative B: Multi-use Throughout and Additional Improvements

The potential conflicts with land use designations and planning will be the same as described as Alternative A.

Alternative C: Protection and Restoration

The potential conflicts with land use designations and planning will be the same as described as Alternative A.

Alternative D: No Action

The potential conflicts with land use designations and planning would be the same as described as Alternative A. Additionally, the No Action alternative would not conflict with any habitat conservation plans or natural community conservation plans and would not be required to acquire any permits due to the fact that there would not be any construction activities.

3.10 Mineral Resources

This section describes the mineral resources of the Ma-le'l Dunes CMA properties.

Regulatory Setting

The Humboldt County General Plan Volume 1 policy 2533.4 encourages the conservation of mineral resource located within Humboldt County.

Affected Environment

The Ma-le'l Dunes CMA does not contain any mineral resources of significant value or areas that are designated as an important mineral resource recovery site in land use plans.

Environmental Consequences

Alternative A: Proposed Plan

The proposed Plan would not result in the loss of known mineral resources that have value to the region or residents of the area. Additionally, the Plan site is not designated as an important mineral resource recovery site in local plans.

Alternative B: Multi-use Throughout and Additional Improvements

The potential impacts to mineral resources would be the same as described as Alternative A.

Alternative C: Protection and Restoration

The potential impacts to mineral resources would be the same as described as Alternative A.

Alternative D: No Action

The potential impacts to mineral resources would be the same as described as Alternative A.

3.11 Noise

This section describes the existing noise of the Ma-le'l Dunes CMA properties.

Regulatory Setting

The Humboldt County General Plan has policies that regulate the on-going noise levels, noise levels during construction activities, and noise compatibility with the surrounding areas. (Policy # 3291.5A-C)

Affected Environment

Environmental Acoustics

Noise may be defined as unwanted sound, which is often unpleasant because it is disturbing or annoying for the listener. A sound's pitch, loudness, or intensity could cause a noise to have an offensive nature. Pitch is the height or depth of a tone or sound. Pitch is controlled by the relative rapidity (frequency) of the vibrations by which sound is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Intensity is a measure of the amplitude of the sound wave (and is called height when referring to an ocean wave). Loudness is the intensity of sound waves combined with the reception characteristics of the ear.

A decibel (dB) is a unit amount of sound that measures the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that a healthy, unimpaired, human ear can hear. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, 20 decibels is a 100 times more intense, and 30 decibels is 1,000 times more intense. The relationship between the subjective noisiness or loudness of a sound and its intensity is a 10-decibel increase in sound level, which is perceived as approximately a doubling of loudness over a fairly wide range of intensities.

The method for characterizing sound in California is the A-weighted sound level or dBA. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. The thresholds for indoor speech interference are about 45 dBA if the noise is steady, and above 55 dBA if the noise is fluctuating. Outdoors speech interference thresholds are about 15 dBA higher, around 60 to 70 dBA. Steady noise of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep.

Noise Environment

The existing noise environment of the Plan site is generally quiet, with sound levels ranging from 50 to 57 dB Ldn. The noise sources at the project site are predominantly from natural sounds, such as wind and tidal wave action, and bird calls (e.g. gulls). The surrounding land uses including operations Sierra Pacific Mill and the Redwood Gun Club are significant existing noise sources to the Plan area. The noise from Sierra Pacific can be heard primarily on weekdays from the access road/Ma-le'l Road. The noise associated with the Redwood Gun Club can be heard from the trails near the RGC property lines on weekend days from approximately 10 a.m. to 4 p.m., and occasionally on weekdays when local law enforcements teams have special training events. Secondary noise sources are from vehicle traffic on the Young Lane Ave, State Route 255, and aircrafts flying overhead can contribute a fair amount of noise, especially during wet weather.

Environmental Consequences

Alternative A: Proposed Plan

Construction Related Noise

The projects of the proposed Plan would generate short-term elevations of noise levels but not to levels that would violate noise standards in the Humboldt County General Plan or any other applicable standards. Noise levels from construction activities would be short-term and not permanently increase ambient noise levels.

Ambient Noise Levels

The Plan would increase the number of people visiting in the Plan area. Subsequently there would be an increase in ambient daytime noise levels related to people's conversations, vehicular engines, and vehicle doors closing. However, these levels are not expected to exceed ambient noise levels of outdoors speech interference thresholds of 60 to 70 dBA.

Firearms Range Related Noise

Noise associated with the shooting of firearms at the Redwood Gun Club will likely startle an increased number of visitors hiking along the trails located near the RGC property boundaries. The proposed Plan incorporates the provision of information about the RGC onto kiosks and in interpretive brochures, such that the visitors to the area will be made aware of the presence of the RGC and not be surprised by the sound of firearms.

Airstrip Noise Levels

Although airports are located in the region, there are no commercial or private airports/airstrips within the vicinity of projects contained in the Access Plan. The project would not expose people working or residing in the area to excessive noise levels.

Alternative B: Multi-use Throughout and Additional Improvements

The potential noise impacts would be the same as described as Alternative A.

Alternative C: Protection and Restoration

The potential noise impacts would be the same as described as Alternative A.

Alternative D: No Action

Construction Related Noise

The No Action Alternative would not produce any construction related noise because there are no construction related activities under this alternative.

Ambient Noise Levels

Impacts to ambient noise levels would be the same as described in Alternative A.

Firearms Range Related Noise

Impacts to firearms range noise levels would be the same as described in Alternative A.

Airstrip Noise Levels

Impacts from airstrip noise levels would be the same as described in Alternative A.

3.12 Population and Housing

This section describes the existing population and housing of the Ma-le'l Dunes CMA properties.

Regulatory Setting

The Plan area is in the jurisdiction of the Humboldt Bay Area Plan, Local Coastal Program for policies pertaining to housing requirements (Policy # 3.28). The projected population growth for Humboldt County is contained in the Humboldt County General Plan Volume 1. (#2200)

Affected Environment

There are currently seven parcels that are zoned residential adjacent to the Ma-le'l CMA. Additionally, one of the parcels contains five mobile homes that are occupied as residences.

Environmental Consequences

Alternative A: Proposed Plan

The proposed Plan would not result in any substantial population growth in the Ma-le'l CMA because the Plan does not provide new homes or businesses or provide for the expansion of facilities that induce growth. Additionally, the proposed Plan would not displace any of the existing housing units or people located adjacent to the Ma-le'l CMA.

Alternative B: Multi-use Throughout and Additional Improvements

The potential impacts to population and housing would be the same as described as Alternative A.

Alternative C: Protection and Restoration

The potential impacts to population and housing would be the same as described as Alternative A.

Alternative D: No Action

The potential impacts to population and housing would be the same as described as Alternative A.

3.13 Public Services

This section describes the existing public services to the Ma-le'l Dunes CMA properties.

Regulatory Setting

Public Services standards follow the Humboldt Bay Area Plan, Local Coastal Program (Policy # 3.22). The Humboldt Bay Area Plan requests that the existing public service facilitates accommodate areas zoned rural for public recreational activities.

Affected Environment

Access routes to both Ma-le'l South and Ma-le'l North are within the jurisdiction of the Humboldt County Sheriffs Department. BLM rangers provide law enforcement for Ma-le'l South and Ma-le'l North via a MOU with USFWS.

A staff of approximately two currently serves the CMA regularly. There is currently no caretaker for the properties. The BLM and USFWS each have a staff member that is responsible for Ma-le'l North and Ma-le'l South.

Environmental consequences

Alternative A: Proposed Plan

Due to the anticipated increased use of the CMA by the public, there would be an increased demand for law enforcement services from both the County Sheriffs Department and from BLM rangers. However, the Plan proposes that BLM and USFWS will work internally with the Sheriff's department to develop a law enforcement protocol, such that the increase will be accommodated.

The proposed action would hire a caretaker contracted to provide services throughout the CMA and recommends an increase in BLM and USFWS staff for other tasks/services outside of the caretaker's responsibilities.

Alternative B: Multi-use Throughout and Additional Improvements

The potential impacts to public services would be the same as described in Alternative A. Alternative B would address increased demand for public services in the same manner as Alternative A.

Alternative C: Protection and Restoration

There would be no impact on public services from Alternative C. This is due to the fact that Alternative C would only allow for supervised and intermittent visits to the area. Therefore, no additional public services would be required.

Alternative D: No Action

The No Action Alternative would not require additional staff or law enforcement to monitor the Plan area because there would not be an increase in public use. The current staff of two at the CMA would be adequate to the serve the public service needs of the No Action Alternative. Therefore, the No Action Alternative would not hire an on-site caretaker or demand, increase BLM or USFWSUSFWS staff, or demand and increase from County Sheriff's or BLM rangers.

3.14 Access and Recreation

This section describes the current public use of the Ma-le'l Dunes CMA properties and the existing access infrastructure located throughout the area. Infrastructure located in Ma-le'l South and Ma-le'l North is discussed separately.

Regulatory Setting

The California Coastal Act of 1976 developed policies to protect access and recreational opportunities in the coastal zone. The California Coastal Act requires that areas within the coastal zone provide maximum access. Therefore, access within the coastal zone shall be conspicuously posted and recreational opportunities, shall be provided for all people consistent with public safety needs to protect public rights, rights of private property owners, and natural resources areas from overuse. Furthermore, the Coastal Act has standards for the distribution of public facilities, including parking areas and associated facilities, to mitigate the possible affects from overcrowding and overuse of any single area. The Act also promotes ocean front land, including upland areas, to be protected for recreational uses, and encourages recreational boating by increasing public launching facilities and providing new boating facilities in protected water.

Additionally, the Humboldt Bay Area Plan, Local Coastal Program developed policies for access way improvements. These access way improvements shall provide support facilities compatible with the character of the land. These access way improvements shall include parking, roads, trails, stairs, and ramps, sanitary facilities, facilities for the handicapped, fencing and barriers, signing of access points, trails and hazard areas, and maintenance and operation of the access way and support facilities.

Affected Environment

Ma-le'l South, owned by BLM, is currently open daily from sunrise to one hour after sunset. Currently visitor use to Ma-le'l South consists of approximately 20 visits a day and one horseback rider a week. The following non-motorized recreational uses are allowed within Ma-le'l South:

- Equestrian use on designated trails and the waveslope.
- Pedestrian use on designated trails, open sandy areas, and the waveslope.
- Leashed dog walking in the developed recreation site (parking/picnic area); otherwise dogs off leash consistent with Humboldt county ordinance.
- Group camping on a case-by-case basis with special recreation permit.

- Vegetation gathering for personal use allowed from March to November.
- Fires in designated sites only.
- Fishing subject to California Department of Fish and Game regulations.

Ma-le'l North has had restricted public access since 1992. A permit can be obtained to access the Fernstrom-Root Parcel, currently managed as part of the Lanphere Dunes Unit, by contacting the USFWS HBNWR or Friends of the Dunes (FOD). Public access in the southern portion of Ma-le'l North is limited to monthly-guided walks by FOD. Currently, visitor use to Ma-le'l North consists of 8 people per month for guided walks and another 8 people per month for restoration activities.

Vehicle, bicycle, and pedestrian access to the Ma-le'l Dunes CMA is from Samoa Boulevard/State Highway 255 via Young Lane. Young Lane is an approximately 400-foot long, paved two-lane road that terminates into the unnamed and unpaved access road that runs in a north-south direction. This road provides access to the gravel parking areas of Ma-le'l North and Ma-le'l South, and is known as Ma-le'l Road throughout this Plan.

Currently, there are over 3 miles of foot trails within the CMA that traverse forest, open sand dunes, and nearshore dunes toward the beach. The foot trails are earthen paths clustered in the far southern and far northern portions of the CMA. The trails in the south are marked; the trails in the north are not. Trails are considered moderate to strenuous due to the varied topography and range of hiking duration offered. Some trails can be completed in less than 30 minutes, while others can offer one to four hours of hiking. Figure 3 illustrates the existing infrastructure throughout the area.

Ma-le'l South

Amenities that support public use within the Ma-le'l South area consist of a recently improved access route, entrance signing, graveled parking lot and day use area with picnic tables, vault toilet, trash receptacles and information kiosks, and trail markers along dune and forest footpaths. These are described in more detail below.

Access

Ma-le'l South is accessed by turning south at Young Lane onto a gravel road owned by USFWS (Ma-le'l Road). The Ma-le'l South parking and day use area is reached after traveling south on Ma-le'l Road approximately 500 feet. This portion of the Ma-le'l Road has been recently regraded and improved with new gravel. The road is discussed further in the Ma-le'l North Access section.

Parking and Day Use Area

Currently, there are two vehicle-parking areas along Ma-le'l Road that provide access to Ma-le'l South. One is the large, main gravel lot at the southern end of Ma-le'l Road, and the other is a small pullout a short distance north of Young Lane, also on Ma-le'l Road, under a Pacific Gas & Electric high voltage transmission line/tower.

The main Ma-le'l South gravel parking lot is about 20,000 sq.ft in area and designed to serve approximately 20 vehicles, including buses and horse trailers. The pullout parking

area beneath the Pacific Gas & Electric high voltage transmission line/tower currently has room for approximately five vehicles.

Recreational Amenities

There are a variety of amenities at Ma-le'l South that help to make the user experience safer and easier. These amenities include signage that directs visitors the appropriate areas and addresses safety concerns, a vault toilet, water spigots, picnic tables, and trash receptacles.

Trails and Trail Amenities

Two trail heads with "rocket-style" information kiosks exist at the Ma-le'l South parking area. One is for equestrians and the other for pedestrians.

The equestrian trail begins with one trail leading west to the beach and then another heading north along the Humboldt Bay Municipal Water District (HBMWD) pipeline, or "waterline trail." The "waterline trail" continues north until it intersects with other foot trails discussed below and turns west through the nearshore dunes to the beach.

The pedestrian foot trail departs the north end of the Ma-le'l South parking area and joins a trail from the forest in route to the equestrian trail mentioned above, where it continues to the beach.

One of the more commonly used foot trails in Ma-le'l South extends west from the small pullout parking area adjacent to the high voltage transmission line tower discussed above. The trail is well defined and passes through forested dunes toward the open dunes and beach. At the foot of the moving dune/deflation plain there is the well-defined intersection mentioned above, where it joins the equestrian and foot trails from the Ma-le'l South parking area.

There are several other casual trails throughout the Ma-le'l South nearshore dunes that lead to the beach.

Ma-le'l North

Amenities that support public use within Ma-le'l North consist of an access road, a gravel parking lot, and unmarked footpaths. Three empty kiosks in addition to boundary signs that mark the southern Fernstrom-Root property line exist in the area.

Access

Ma-le'l North is accessed by the single lane, gravel access road that extends from Young Lane to the USFWS parking area. The access road is approximately 4,400 feet long and centered on a 60-foot wide right of way owned by USFWS.

Parking and Day Use Area

At the northern terminus of the access road is a gravel clearing adjacent to the Mad River Slough that serves as a parking area and was previously used as the parking area for the Mad River Slough and Dunes CMA. The clearing is approximately one third of an acre in size and can accommodate about 10 vehicles. At the northern edge of the area, there is a wooden entry sign demarcating the Parking Area of the Mad River Slouch and Dunes CMA, a metal bike rack and an iron ranger, which demarcates the trailhead.

Kayak and Canoe Launching and Landing

Kayak and canoe enthusiasts use the Mad River Slough extensively. Boat launching into the slough commonly occurs beneath the Mad River Slough bridge on Highway 255 where a concrete ramp is located, and on the Lanphere Road bridge, where a rock abutment to the bridge is located. The existing parking area of Ma-le'l North is adjacent to an intertidal channel of the Mad River Slough that is a popular boat-landing site during high tides. Due to the presence of salt marsh habitat and trampling that has occurred from boaters, the CNLM established symbolic fencing to discourage boat landing.

Trails and Trail Amenities

Railroad Berm Trail

The railroad berm trail is a well-defined, flat footpath varying from two to six feet in width that extends north from the parking area. It follows the railroad berm in a northeasterly direction for a distance of approximately 2800 feet along the edge of the slough to where an abandoned railroad trestle is located.

Dune Overlook Trail

A short distance from the parking area along the railroad berm trail a spur trail extends west 80 feet up to a vantage point atop a dune at an elevation of approximately 90 feet above mean sea level.

Forest Loop Trails

There are two trails that depart from the main railroad berm trail and lead into the forested dunes. Combined, these two trails create a loop through the forest towards a clearing adjacent to Iron Creek, a fresh water stream. Approximately half way along the length of the forest trails there is a short cut that creates a shorter loop. The trails are generally well defined and approximately two to four feet in width.

Dune Trail to the Beach

Where the forest loop trail is closest to the dunes there is a weathered but intact kiosk and a trail that leads out of the forest and up to the open, moving dune system. The trail up the dune is steep and in loose sand. Once on top of the dune, the trail appears to follow the Humboldt Bay NWRC posts and signs along the Fernstrom-Root southern boundary to navigate to the beach. Moving sand across the dune often obscures most evidence of any dominant foot trail. A tangle of wire and metal posts is periodically exposed near the dune deflation plain. At the back/leeward side of the primary foredune a poorly defined footpath is visible to the beach.

Environmental Consequences

Alternative A: Proposed Plan

The proposed Plan has planned for a significant increase in access and recreation within the Ma-le'l CMA. The increase is visitors to the Ma-le'l South and Ma-le'l North areas

expected to total approximately 16,500 and 8,000 persons per year, respectively (Bruce Cann and Andrea Pickart, personal communication, 2005). Expected boat use is approximately ten per weekend day during peak summer hours. During the weekdays, a maximum of five boats per day is expected in good weather. Use levels for traditional resource gathering are expected to be low; perhaps five visits per year by one or a few tribal members. No more than 50 program participants/special groups are expected to visit Ma-le'l North with no more than six special groups per month.

It is expected that most visitors to the Ma-le'l Dunes CMA would arrive by private vehicle. Field trip classes, volunteers, and work crews are expected to arrive at the site by bus and/or by van. Equestrians would arrive at Ma-le'l South with horse trailers. Some visitors to Ma-le'l North would arrive by bicycle, kayak, or canoe.

To accommodate for this increase in visitors to the Ma-le'l CMA, the proposed action would provide improvements to the existing infrastructure and new amenities that would help to improve the users experience of the area. These improvements include improving roads and parking areas, increasing recreational amenities including vault toilets, water spigots, bicycle rack, cooking grill, and increasing the recreational facilities including new trails and kayak and canoe boat landing docks. The new trails proposed and their approximate lengths are discussed in Table 6. Additionally, the improvements and new infrastructure have incorporated human safety measures, erosion control measures, and measures for protecting the natural and cultural resources of the area into the proposed Plan.

Physical effects from the increased use of the Ma-le'l CMA are discussed throughout CH-Affected Environment and Environmental Consequences. Because the project incorporates appropriate signing, an on-site caretaker, law enforcement patrols, and consistent maintenance of trails, any possible effects will be minimal and insignificant.

Alternative B: Multi Use Throughout and Additional Improvements

Alternative B would accommodate a significant increase in access and recreation similar to the Proposed Plan. The increase in visitors to the Ma-le'l CMA would be expected to be approximately the same amounts as the Proposed Plan. The improvement to the Ma-le'l CMA would be the equivalent to the Proposed Plan with additional improvements and infrastructure. These additional improvements and increased infrastructure would include a pedestrian trail connecting Ma-le'l North to Ma-le'l South, paving the access road and associated parking lots with asphalt, and additional public use throughout the CMA including bicycle riding, equestrian use on a portion of the nearshore dunes/coastal trail (Latkak Trail), and increased off-leashed dog walking.

Table 6. Approximate Length of Trails at the Ma-le'l Dunes CMA

Location/Draft Trail Name	Approximate Length, (ft)	Approximate Length, (miles)
Existing/Continued Hiking in Forest and Nearshore Dunes Trails		

Wonokw & Letik	5,250	1.0
Existing/Continued Equestrian in Nearshore Dunes Trails		
Latkak	4,200	0.8
Total Existing Trail	**9,450**	**1.8**
New Nearshore Dunes Trails		
Hudt	2,500	0.5
Ki'mak	2,600	0.5
New Latkak	1,900	0.4
	7,000	1.3
New Forest Trails		
Hop'o'y Loop	7,050	1.3
ADA	2,800	0.5
New Wonokw	1,450	0.3
	11,300	2.1
Total New Trail	**18,300**	**3.5**
Grand Total Length of Trails	**27,750**	**5.3**

Physical affects from the increased use of the Ma-le'l CMA are discussed throughout CH-3 Affected Environment and Environmental Consequences. Any possible physical affects to the area that could result from its increased use are mitigated for with mitigation measures, which primarily consist of signage guiding people away from biologically and culturally sensitive areas.

Alternative C: Protection and Restoration

Alternative C: Protection and Restoration would significantly decrease the access and recreation opportunities within the CMA. Access would only be provided to Ma-le'l North via docent led tours, restoration activities, and cultural gatherings. Under Alternative C the Ma-le'l South day use/picnic area and beach hiking trails would remain open to the public; however, the forest trails and beach trails currently used for dog walking and equestrian use would only be open to the public via docent led tours, permitted uses, and field trips. Additionally, equestrian use and dog walking would be prohibited within the CMA. The expected use of Ma-le'l North would be expected to be eight people per month for guided walks, another 8 people per month for restoration activities, and an unknown amount for cultural gathering. The expected use of Ma-le'l South would be approximately 10 visits a day.

Alternative D: No Action

Under the No Action Alternative the access and recreational uses would remain the same as described in the affected environment. The visitor use of the Ma-le'l CMA would remain as it presently is, with open access to Ma-le'l South and guided tours of Ma-le'l North. Additionally, the recreational amenities and access infrastructure would remain as it presently exists.

3.15 Transportation/Traffic

This section describes the existing transportation systems and traffic of the Ma-le'l Dunes CMA properties.

Regulatory Setting

The Humboldt County General Plan Volume 1 supports improvements and maintenance of public access roads designated natural resource areas. (Policy # 4231.2)

Affected Environment

Vehicle, bicycle, and pedestrian access to the Ma-le'l Dunes CMA is from Navy Base Road/State Highway 255 via Young Lane. Young Lane is a short paved two-lane road that terminates into the unpaved and unnamed access road that runs in a north-south direction. This road provides access to the gravel parking areas of Ma-le'l North and Ma-le'l South.

Currently, there are three vehicle-parking areas off the access road that provide access to the Ma-le'l Dunes CMA. The main Ma-le'l South gravel parking lot is about 20,000 sq/ft in area and designed to serve approximately 20 vehicles, including buses and horse trailers. The second Ma-le'l parking area is located beneath the Pacific Gas & Electric high voltage transmission line/tower and accommodates approximately five vehicles. The Ma-le'l North parking area is located at the northern terminus of the access road. It is a dirt clearing area adjacent to the Mad River Slough that serves has a parking area. The

clearing is approximately one third of an acre in size and can accommodate about 10-15 vehicles.

Casual observation indicate that currently, public access and associated traffic is limited to no more than a few cars a day, which park at the existing Ma-le'l South/BLM parking areas, or just outside the USFWS gate.

Environmental Consequences

Alternative A: Proposed Action

Increase Existing Traffic Conditions

The proposed Plan would increase the traffic on Young Lane (a county road) and on the access road (owned by USFWS), relative to the existing traffic. Signage, advertisements, and a public opening would encourage additional visitors to the area.

The proposed Plan would accommodate this increase in traffic by improving the existing gravel access road leading to the designated parking areas in both Ma-le'l North and Ma-le'l South. The access road would be improved by constructing "pull outs" in areas where no fill in wetlands or bank cuts are required, providing a turning radius at the Young Lane-Ma-le'l Road intersection to accommodate vehicle turn-arounds, and installing gutter sections along roadway where needed.

The acess road would remain "one lane" at 16 - 20 feet in width. The increase in traffic would be accommodated by these improvements and would not adversely impact the load or capacity of the access road or Young Lane. Therefore any impacts are considered insignificant.

Increase in Traffic Hazards

The Plan would continue to use gravel road access and gravel parking areas. Due to the limited width of the access road, signage would be required to remind drivers to obey the speed limit and to be aware of pedestrian and foot traffic. Within the parking areas there would be landscape barriers that separate pedestrian use from automobiles. Incorporation of these design features should not significantly increase hazards associated with transportation/traffic. Additionally, the proposed Plan would improve emergency access to the Ma-le'l Dunes area during daylight hours by providing improvements to road and trail systems. Emergency access at nighttime hours would be accommodated by providing keys to the locked gates to appropriate law enforcement officers and emergency services.

Increase the Need for Parking Facilities

The Plan proposes to expand and improve parking to accommodate the increased use of the Ma-le’l CMA. The improvements to the Ma-le’l North parking area would include enlarging, re-orienting, and re-surfacing the parking area with crushed gravel. It would also be upgraded to include: ten motorized vehicle spaces and bus parking with one ADA

vehicle space, with expansion of the parking area for nine additional motorized vehicle spaces. Therefore, the Plan would not result in inadequate parking facilities.

Conflicts with Alternative Modes of Transportation

Improved access to the Ma-le'l Dunes CMA by alternative modes of transportation is included in the proposed Plan. The Plan includes installing bicycle racks to the Ma-l'el South day use picnic area and Ma-le'l North parking area and a 1,000 ft. pedestrian safety corridor along the access road. The Plan would not conflict with adopted policies, plans, or programs supporting alternative transportation. Additionally, the Plan would not affect air traffic patterns of nearby private and commercial airports.

Alternative B: Multi-Use Throughout with Additional Improvements

Increase Existing Traffic Conditions

The increase to existing traffic conditions would be the same as described in Alternative A.

Increase in Traffic Hazards

Alternative B would pave the access road and parking areas of the Ma-le'l CMA. Paving the access road can consequently increase the traffic hazards along Ma-le'l road because vehicles and bicycles will be traveling at higher speeds. Higher speeds along the access road could cause an increase in vehicular collisions, potentially pedestrian-vehicular collisions, and bicycle-pedestrian-vehicular collisions.

Design features and signage to remind pedestrians and vehicles of traffic hazards would be the same as the Proposed Plan. Emergency access to the Ma-le'l Dunes CMA would be as the Proposed Plan.

Increase the Need for Parking Facilities

The increased need for parking facilities would be the same as described in Alternative A: Proposed Plan.

Conflicts with Alternative Modes of Transportation

The conflicts associated with alternative modes of transportation would be the same as described in Alternative A: Proposed Plan.

Alternative C: Protection and Restoration

Increase Existing Traffic Conditions

Alternative C: Protection and Restoration would not increase the existing traffic conditions to the Ma-le'l CMA. Alternative C would reduce the existing traffic on Young Lane and on the access road because Ma-le'l North would remain closed to public except

for docent led tours and restoration activities. Additionally, only the Ma-le'l South day use/ picnic area and beach hiking trails would remain open for public use and the forest hiking trails and additional beach trails would be closed to the public except for docent led tours, field trips, and permitted uses.

Increase in Traffic Hazards

Alternative C: Protection and Restoration would reduce the traffic hazards within the Ma-le'l CMA due to the fact that the Ma-le'l North access road would be closed to the public except for docent led tours and restoration activities. Design features and signage to protect people from traffic hazards would be unnecessary due to the fact that there would be very limited pedestrian and vehicular interaction within the Ma-le'l CMA. Emergency access to the Ma-le'l Dunes CMA would be as the Proposed Plan.

Conflicts with Alternative Modes of Transportation

Improved access to the Ma-le'l Dunes CMA for alternative modes of transportation is not included in Alternative C. However, conflicts with alternative modes of transportation are not predicted due to the very limited access to the Ma-le-l CMA. Alternative C would not conflict with adopted policies, plans, or programs supporting alternative transportation. Additionally, the Plan would not affect air traffic patterns of nearby private and commercial airports.

Alternative D: No Action

Increase Existing Traffic Conditions

The No Action Alternative would not increase the existing traffic conditions to the Ma-le'l CMA. Young Lane, the county road that leads to the access road, would not have an increase in traffic relative to the existing traffic because the No Acton Alternative would not substantially increase access to the area. Additionally, under the No Action Alternative, the USFWS access road would not be open to the public and there would be no change to the existing traffic conditions, which is presently minimal.

Increase in Traffic Hazards

Under the No Action Alternative Ma-le'l North would not have an increase in traffic hazards because the access road and parking area would remain closed for public access. However, Ma-le'l South would continue to have traffic hazards associated with the parking area located at the PG&E high voltage tower, due to the fact that there is no pedestrian corridor between the two parking area.

Increase the Need for Parking Facilities

The No Action Alternative would not require any additional need for parking facilities. The existing parking facilities would accommodate the use levels of the No Action Alternative.

Conflicts with Alternative Modes of Transportation

The No Action alternative would not install additional bicycle racks or pedestrian corridors; however, there would not be any conflicts with alternative modes of transportation. The No Action Alternative would not conflict with adopted policies, plans, or programs supporting alternative transportation. Additionally, air traffic patterns of nearby private and commercial airports would not be affected.

3.16 Utilities and Service Systems

This section describes the existing utilities and services of the Ma-le'l Dunes CMA properties.

Regulatory Setting

The Humboldt County General Plan has policies governing solid waste collection within Humboldt County including the establishment of a management system for solid waste and recycled items (Policy # 4611).

Affected Environment

Water

Potable water service is supplied to three locations within the Plan area; the Ma-le'l South main parking area, the Ma-le'l south special events area and the caretaker's area. Several water spigots exist in various locations at the Ma-le'l South parking area, and one spigot exists at each the special events area and the caretaker's area. The Manila Community Services District provides water to the Ma-le'l CMA. Meters are located adjacent to the board fence that delineates the Ma-le'l south parking area and at the intersection of Young Lane and the access road.

Electricity

The only location in the Plan area served with electricity is the caretaker's area. This location is metered by Pacific, Gas, & Electric, however, it is unknown if the service is operational. The electrical line is buried along the west side of the access road.

Telephone

The only location in the Plan area served by telephone service is the caretaker's area. It is assumed there is no operational account at this time since the site is vacant. The Redwood Gun Club is also serviced by telephone and is currently operational.

Wastewater

There is a single vault toilet located at the Ma-le'l South parking lot. Vault toilets are self-contained and require occasional servicing. There is no sewer service to the Plan

area. The Manila Community Services District provides service to the adjacent residential properties to the south and east of the CMA.

Environmental Consequences

Alternative A: Proposed Plan

Water and Wastewater

The proposed Plan would not have adverse affects on the existing wastewater and water systems of the Ma-le'l CMA. The proposed Plan would install an additional vault toilet in the Ma-le'l North parking areas. Therefore, no wastewater treatment or disposal and no effluent discharges are planned under the proposed Plan.

Additional water spigots would be installed at the Ma-le'l South parking area for equestrian uses, which can be sufficiently supplied by the Manila Community Services District. The caretakers' residence water line would not be replaced or expanded under the proposed Plan.

Stormwater

The expansion of the parking facilities in Ma-le'l North and improvement to the access roads included in proposed Plan could potentially increase the stormwater drainage. Typical stormwater pollutants from parking lots and roads are hydrocarbons and metals. However, due to the design of the parking facility with a gravel semi permeable surface, stormwater drainage and pollutants are typically absorbed and sequestered within the gravel media and therefore pose little potential risk to downstream receptors. As described in the Hydrology section, the parking lot and access road design would include BMP's that reduce erosion and non-point source pollution, and would meet the design guidelines and performance criteria of the California Stormwater Quality Association's Stormwater Best Management Practice (BMP) Handbooks.

Solid Waste

The minimal increases in solid waste generated by the projects contained in the access Plan are expected to have no impact on the Humboldt Waste Management Authority's (HWMA) transfer station, which is currently operating at 350 tons per day below its capacity (Kindsfather, 2004). Additionally, The projects contained in the Access Plan would comply with all federal, state, and local regulations, including those pertaining to solid waste.

Electricity and Telephone

The proposed Plan would not supply any electricity or telephone services to the Ma-le'l CMA. Cellular phones would provide telephone service and electricity would be not be expanded to provided for recreation users.

Alternative B: Multi- Use Throughout and Additional Improvements

Water and Wastewater

Water and waste water facilities would be the same as the Alternative A: Proposed Plan.

Stormwater

The expansion of the parking facilities in Ma-le'l North and paving the access roads and parking areas could increase the stormwater drainage. Typical stormwater pollutants from parking lots and roads are hydrocarbons and metals. As described in the Hydrology section, the paving of the parking lots and access road would increase stormwater runoff into ditches and vegetated area or directly in to adjacent wetlands. Due to high infiltration rates of the soils surrounding the parking areas it is unlikely that runoff form these areas will directly flow into the surrounding wetlands. Hydrocarbons and metals and other stormwater related pollutants would be sequestered in the soils. Ditches drain much of the access road storm flows, which will increase with the paving of the road. Also, in areas where the road borders wetlands there is no room for drainage structures and so small amounts of runoff will flow directly from the road to adjacent wetlands.

With appropriate stormwater design, impacts should be less than significant. A site-specific SWPPP will be developed and implemented that will identify the measures that will be taken to prevent storm water pollution caused by development and construction activities. In addition, any design will include best management practices that reduce erosion and non-point source pollution, and that meet the design guidelines and performance criteria of the California Stormwater Quality Association's Stormwater BMP Handbooks.

Solid Waste

The potential impacts from solid waste generation would be the same as described in Alternative A.

Electricity and Telephone

Electricity and telephone service would be the same as described in Alternative A.

Alternative C: Protection and Restoration

Water and Wastewater

Alternative C would not require additional wastewater or water facilities due to the very limited access to the Ma-le'l CMA. The existing vault toilet and water spigot located at the Ma-le'l South parking area is sufficient to support water and wastewater needs within the Ma-le'l CMA under Alternative C.

Stormwater

Stormwater facilities would be the same as described in Alternative A: Proposed Plan.

Solid Waste

The potential impacts from solid waste generation would be the same as described in Alternative A.

Electricity and Telephone

Electricity and telephone service would not be provided under Alternative C.

Alternative D: No Action

The No Action Alternative would not supply any additional utilities to the Ma-le'l CMA. Water, wastewater, electricity, telephone service, solid waste collection would remain as it was described above in the affected environment.

Additional Critical Elements for NEPA compliance that need to be addressed include:

Areas of Critical Environmental Concern (ACEC): The original BLM Ma-le'l South parcel was designated an ACEC in 1992 pursuant the Arcata RMP to protect the sensitive dune habitat on the parcel. The RMP also states that any adjoining parcels acquired by the BLM will be managed under the same direction of the existing public lands. The proposed action will have minimal impacts to ACEC values, as trails and other public use areas have been sited to avoid impacting sensitive dune habitat. Alternatives B and D would cause greater impacts, while Alternative C would cause less impacts than the proposed action.

Environmental Justice: No minority or low income groups would be affected by disproportionately high and adverse human health or environmental effects under the proposed action or any of the alternatives.

4.0 CUMULATIVE EFFECTS

Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the Plan. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Impacts to resources in the Plan area could result from an increase of recreational or residential development in the vicinity of the Plan area. These land use activities could degrade the habitat and species diversity through consequences such as fragmentation or displacement of habitats and populations, alterations of hydrology, erosion, disruption of migration corridors, and increased recreational access from pedestrian and equestrian uses. These cumulative impacts can also contribute to potential cultural resource impacts.

CEQA Guidelines, Section 15130 describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impact. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the CEQA regulations.

Affected Environment

The Lanphere Dunes Unit of Humboldt Bay National Wildlife Refuge is located directly north of the Plan area and consists of approximately 305 acres. The Lanphere Dunes Unit is one of the last stands of pristine coastal dunes in the Pacific Northwest. The unit has been open to the public since 1974 by written permission and docent led tours only for passive recreational uses. Passive recreational uses include pedestrian uses such as hiking, birding, and photography. Additionally, the unit has undergone extensive restoration activities for the elimination of European beachgrass, iceplant, yellow bush lupine, annual grasses, English Ivy, and other invasive plants since it was acquired by The Nature Conservancy in the 1970's.

The Manila Dunes Recreation Area is located south of the Plan area and consists of approximately 100 acres. The Recreation Area has been open to the public since 1991 for recreational activities including hiking, birding, photography, and dog walking and equestrian uses. Dune restoration activities to eliminate beachgrass, iceplant, and lupine have taken place in the Recreation Area since 1991. In addition, the Recreation Area will be acquiring another 54.5 acres directly north of the area to manage for recreational uses, restoration activities, and protection of endangered species. Recreational uses in the additional 54.5 acres will include pedestrian and equestrian uses.

Environmental Consequences

The proposed Plan combined with the adjacent recreational areas discussed above could potentially increase the recreational use of the Samoa Peninsula for activities such as equestrian use, dog walking, hiking, bird watching, photography, and restoration activities. An increase in recreational users to the Plan area and the adjacent recreational areas could potentially cause cumulative negative impact to the biological and cultural resources located within the area. An increase in use to these areas could result in the illegal collecting of cultural remains as well as the trampling/killing of endangered and special status plant species. For example, potential unauthorized pedestrian and equestrian access to adjacent properties, including the Lanphere Unit of HBNWR, could impact rare plants species that occur in those areas. However, the restoration activities that are taking place at the Lanphere Dunes Unit, Manila Dunes Recreation Area, and the Ma-le'l CMA to remove non-native species and reforest the CMA will create additional habitat for special status and endangered plant species. BLM and FWS plan to continue restoration work and weed eradication efforts within the CMA with the assistance of the California Conservation Corps and Friends of the Dunes restoration programs. Activities from these projects are not expected to adversely impact listed species. In contrast, they are likely to have a beneficial effect by restoring habitat., The Plan mitigates to an insignificant level the potential impacts of the proposed project. At this time there are no known activities in the area, either ongoing or planned in the foreseeable future that would cause impacts that would result in a cumulative impact on the resources in the planning area. The potential impact to cultural resources from increased use of the area is not anticipated to cause substantial adverse impacts on archaeological sites and traditional activity areas. In light of these circumstances it is not anticipated that the project would result in cumulative impacts.

5.0 COMMENTS AND COORDINATION

Coordination with the general public and appropriate public agencies is an essential part of the environmental review process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures and related environmental requirements. Agency consultation for this Plan has been accomplished through a variety of formal and informal methods, including: Plan development team meetings and interagency coordination meetings. This chapter summarizes the results of the efforts by the SCC, USFWS, and BLM to fully identify, address and resolve plan-related issues through early and continuing coordination.

Consultation and coordination has been conducted with the following entities:

- Friends of the Dunes
- Wiyot Tribe
- Mad River Biologists
- Arcata Fish and Wildlife Office
- Northwest Information Center of the California Historical Resources Information System
- Adjacent Land Owners
- Humboldt Bay Municipal Water District
- Redwood Gun Club
- Sierra Pacific Industries
- Explore Northcoast
- Redwood Community Action Agency
- Center for Natural Lands Management
- Manila Community Services District

The Wiyot Tribe was contacted concerning cultural and gathering resources within the Plan vicinity. In addition, the Wiyot Tribe was contacted regarding access to the Plan area for traditional vegetation gathering.

HWR Engineering and Science with FOD participated in discussions with the State Coastal Conservancy, BLM and USFWS staff and local stakeholders to develop the Ma-le'l CMA Access Plan. This planning process consisted of a series of meeting and tours of the Plan area with the participating agencies and local stakeholders.

Outreach meeting with various stakeholder groups included a meeting with the Dunes Forum members (which included members of the Humboldt Coastal Coalition and other citizen groups) via representation at the Dunes Forum regular meetings. Additionally, outreach meetings were held with representatives of the Wiyot Tribe, "large" adjacent landowners including the Redwood Gun Club, Humboldt Bay Municipal Water District, and Sierra Pacific Industries, and residents living adjacent to or along Young Lane. During the outreach efforts and meetings, handouts and maps describing the project area were distributed, access Plan process and goals were reviewed, and stakeholder concerns were solicited and recorded. Additionally, meeting were followed up with telephone interviews and written correspondence with members of the stakeholder groups.

6.0 MITIGATED NEGATIVE DECLARATION

Proposed Mitigated Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

The State Coastal Conservancy (SCC), together with the US Fish and Wildlife Service and USDI-Bureau of Land Management (BLM), proposes to implement the Ma-le'l Dunes Cooperative Management Area (CMA) Public Access Plan (the Plan), which contains actions to accommodate safe, orderly, and open public access and a range of recreational opportunities designed to minimize to the extent practical any adverse impact to the natural and cultural resources of the area. The Plan proposes new and continued operation of recreational land use allocations within the Ma-le'l Dunes CMA; it also proposes the new installation, upgrade, and/or continued operation of roads, day use areas, parking areas, public restrooms, designated coastal access trails, informational and interpretive signing, two view decks, a footbridge, and a canoe and kayak landing and launching ramp. The Plan is intended to be the basis for construction drawings, educational and interpretive publications, inter-agency coordination, and future funding.

Determination

This proposed Mitigated Negative Declaration (MND) is included to give notice to interested agencies and the public that it is the State Coastal Conservancy's intent to adopt an MND for this Plan. This does not mean that the State Coastal Conservancy's decision regarding the Plan is final. This MND is subject to modification based on comments received by interested agencies and the public.

The SCC has prepared an Initial Study for this project, and pending public review, has determined that, although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. Revisions to the project include the following:

Biological Resources

Mitigation Measure 1: Planned improvements would occur during the dry season in seasonal wetlands and would incorporate Best Management Practices (BMPs) to control sediment transport, such as conducting work during low tide, and use of silt fencing if necessary.

Mitigation Measure 2: During the breeding season for birds likely to breed in the Ma-le'l Dunes Cooperative Management Area (CMA) (February 15 to August 15), construction activities and routine maintenance would utilize only non-mechanized equipment. Only hand tools and clippers would be allowed during this period, except to

address emergency and/or public health and safety conditions when mechanized equipment would be allowed (such as restroom pumping and road grading). The use of mechanized equipment within the breeding season for birds likely to breed in the Ma-le'l Dunes CMA to address these conditions would be conducted at the discretion of the Ma-le'l Dunes CMA managers.

Mitigation Measure 3: The USFWS will implement Humboldt Bay wallflower seed collection from existing populations on the adjacent Lanphere Dunes Unit, and subsequent dispersal within newly restored areas of the Fernstrom-Root and Ma-le'l parcels. This measure is designed to facilitate the expansion of the wallflower within the CMA and mitigate for potential adverse impacts from off-trail foot traffic. The refuge will obtain a recovery permit.

Mitigation Measure 4: All construction activities occurring within or adjacent to endangered plant areas would be supervised by Ma-le'l Dunes CMA resource managers and would take place outside of the growing season to avoid impacts to reproductive individuals. In addition, before the commencement of work and when species are clearly visible all occurrences of Humboldt Bay wallflower rosettes (reproductive season is approximately March 1 through the end of the summer), beach layia (reproductive season is March to May), Humboldt Bay owl's-clover (reproductive season is May through July), Point Reyes bird's-beak (reproductive season is approximately June 1 through end of summer), and other rare plant species located near construction areas would be flagged and the CMA resource managers would document any adversely affected individuals.

Mitigation Measures 5: One hundred and seventy-five square feet (175 sf) of high salt marsh habitat (6.4 to 8.9 feet above mean-low-low-water) that is dominated by dense-flowered cordgrass (*Spartina densiflora*) would be restored with pickleweed (*Salicornia virginica*) and saltmarsh (*Distichlis spicata*) and maintained as such as mitigation for the installation of the canoe/kayak landing/launching ramp.

Mitigation Measures 6: The development of a maintenance program for the forest trails in Ma-le'l North to insure that routine vegetation clearing does not adversely affect locally rare plants identified by the CMA resource managers.

Cultural Resources

Mitigation Measure 7: In the event any undiscovered paleontological, archaeological, ethnic, or religious resources are encountered during grading or construction-related activities, in compliance with the state and federal law, all work within 100 feet of the resources shall be halted and the Plan applicants shall consult with a registered professional archaeologist and designated representative of the Wiyot Tribe to assess the significance of the find and formulate further mitigation. This would include coordination with the Native American Heritage Commission. The Native American Heritage Commission would contact the Wiyot Tribe, as deemed necessary, to assist in assessing the significance of any find. If any find is determined to be of significance, the USDI-BLM and FWS, and a qualified archaeologist would meet to determine the appropriate course of action. Pursuant to the California Health and Safety Code Section 7050.5, if human remains are encountered, all work would cease and the County coroner would be

contacted. The county coroner and Native American Heritage Commission would be charged with determining if the human remains are of Native American origin.

Mitigation Measure 8: Cultural monitors will be present during initial, native soil disturbance activities that occur at locations mutually agreed upon by the Wiyot Tribe, USFWS, and BLM (as necessary) as areas of the greatest concern.

Mitigation Measure 9: Regulatory signing would state that in accordance to state law, destruction, and defacement of historical objects (Penal Code 655-1/2 and relevant federal law) and removal of human remains (PRC 5097.5, PRC 70550.5, and relevant federal law) is a punishable crime. Undesignated canoe and kayak landings located on the slough and within the project boundary would be re-vegetated and signed "No Landing/Re-vegetation in Progress."

Mitigation Measure 10: USFWS, BLM (as necessary), and the Wiyot Tribe would work collaboratively with a registered professional archaeologist to prepare a baseline review of the cultural resources that the Tribe and agency staff mutually agrees upon as the areas of greatest concern. Thereafter annual review with a registered professional archaeologist or designated representative of the Wiyot Tribe would occur. Furthermore, Ma-le'l Dunes CMA managers would conduct regular monitoring to ensure against vandalism of cultural resources within mutually agreed upon areas of greatest concern. Results of cultural resources monitoring would be conveyed to the appropriate agencies.

Hydrology and Water Quality

Mitigation Measure 1:

Planned improvements would occur during the dry season in seasonal wetlands and would incorporate Best Management Practices (BMPs) to control sediment transport, such as conducting work during low tide, and use of silt fencing if necessary.

_____ _____

Samuel Schuchat, Executive Officer Date
State Coastal Conservancy
13300 Broadway, 11th Floor
Oakland, CA 94612

7.0 FINDING OF NO SIGNIFICANT IMPACT

Having reviewed this Environmental Assessment, including the explanation and resolution of any potentially significant environmental impacts, the BLM and USFWS have determined that the Proposed Action with the mitigation measures will not have any significant impacts on the human environment and that an EIS is not required. The proposed project is in conformance with approved land use plans.

Authorized Official: _____ Date: _____
Lynda J. Roush
Arcata Field Manager

Authorized Official: _____ Date: _____
Eric T. Nelson
Refuge Manager

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9.0 APPENDICES

Appendix A: Joint CEQA/NEPA Checklist

Appendix B: Biological Assessment

Appendix C: Mitigation and Monitoring Program

APPENDIX A: ENVIRONMENTAL CHECKLIST

1.	**Project Title**	Ma-le'l Dunes Access Plan Project
2.	**Lead Agency Name and Address**	State Coastal Conservancy 1330 Broadway, 11th Floor Oakland, CA 94612
3.	**Contact Person and Phone Number**	Susan Corbaley 510-286-6767
4.	**Project Location**	The Ma-le'l Dunes Cooperative Management Area (Ma-le'l Dunes CMA) is located approximately one mile north of the unincorporated town of Manila, in Humboldt County, California, on the north spit of Humboldt Bay, (also known as the Samoa Peninsula), and is approximately 3.5 miles west of the City of Arcata. The Ma-le'l Dunes CMA consists of approximately 444 acres of forest, dunes and salt marsh that stretches along approximately 1.5 miles of coastline, and contains areas owned by two federal agencies, namely the United States Fish & Wildlife Service (USFWS) and the United States Bureau of Land Management (BLM). BLM owns and manages 154 acres in the southern portion of the project area, which is known as Ma-le'l South. USFWS owns and manages 290 acres on the northern portion of the project area, which is known as Ma-le'l North.
5.	**Project Sponsor Name and Address**	U.S. Fish and Wildlife Service Humboldt Bay National Wildlife Refuge 1655 Heindon Road Arcata, CA 95521 and U.S. Bureau of Land Management Arcata Field Office 1695 Heindon Road Arcata, CA 95521
6.	**General Plan Designation**	Natural Resources
7.	**Zoning**	Zoning conforms to general plan designations described above.

8.	**Description of Project**	The State Coastal Conservancy (SCC), together with the USFWS and BLM, proposes to implement the Ma-le'l Dunes CMA Public Access Plan (the Plan), which contains actions to accommodate appropriate and orderly public access and a range of recreational opportunities designed to minimize to the extent practical any adverse impact to the natural and cultural resources of the area. The Plan proposes new and continued operation of recreational land use allocations within the Ma-le’l Dunes CMA; it also proposes the new installation, upgrade, and/or continued operation of roads, day use areas, including parking areas and public restrooms, and designated coastal access trails and trail amenities, including informational and interpretive signing, two view decks, a footbridge, and a canoe and kayak landing and launching ramps. The Plan is intended to be the basis for construction drawings, educational and interpretive publications, inter-agency coordination, and future funding.
9.	**Surrounding Land Uses and Setting**	The project area is west of the Mad River Slough, generally north of the Mad River Slough Bridge on Hwy 255, and south of the Lanphere Dune Unit of the Humboldt Bay National Wildlife Refuge, but excludes the area that is occupied by Sierra Pacific Industries, the Redwood Gun Club, and a group of approximately eight residential properties.

Environmental Factors Potentially Affected

The environmental factors checked below would potentially be affected by this Plan (i.e., the Plan would involve at least one impact that is a 'potentially significant impact'), as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agricultural Resources	☐ Air Quality
☒ Biological Resources	☒ Cultural Resources	☐ Geology/Soils
☐ Hazards and Hazardous Materials	☒ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation /Traffic
☐ Utilities/Service Systems	☒ Mandatory Findings of Significance	

Determination:

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have an impact on the environment that is potentially significant or potentially significant unless mitigated but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures based on the earlier analysis, as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required.

Samuel Schuchat 2/1/07

Samuel Schuchat, Executive Officer — Date
State Coastal Conservancy

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
I. AESTHETICS. Would the Plan:				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	☐	☐	☐	☒
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☐	☒

Finding of Fact

a. The Plan does not contain actions that would have any adverse impact to scenic vistas.

b. The Plan is located near California State Highway 255, which is not currently listed as an official state scenic highway. The Plan does not contain actions that would have an adverse impact to scenic resources along a scenic highway.

c. The Plan does not contain actions that would degrade the existing visual quality of the site. The Plan would change the existing visual characteristics of the Plan area by the construction of some of the proposed projects in the Access Plan. However, the access improvements proposed in the Plan, include provisions for enhanced recreational facilities and signage, which would likely enhance the visual quality of the site. The construction activities involved in the Plan areas may have an adverse effect on the visual quality of the site. However, due to the short-term nature of the activities, this impact would be temporary.

d. The Plan would not involve installation of any new lighting systems or sources of glare.

Mitigation and Monitoring

None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
II. AGRICULTURAL RESOURCES. In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation. Would the Plan:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	☐	☐	☐	☒
c. Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	☐	☐	☐	☒

Finding of Fact

a. The Humboldt County Land Use designation throughout the Plan area is Natural Resources, and it is located within the coastal zone as defined by the California Coastal Act. The Plan does would not require conversions of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.

b. As the area is not zoned agricultural, the Plan does not conflict with zoning for agricultural use or a Williamson Act contract.

c. There are currently agricultural lands used for grazing northeast of the Plan area. Projects contained in the access Plan are not anticipated to result in conversions of farmland to non-agricultural use.

Mitigation and Monitoring

None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the Plan:				
a. Conflict with or obstruct implementation of the applicable air quality plans, such as the Air Quality Attainment Plan or Congestion Management Plan?	☐	☐	☒	☐
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a non-attainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e. Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Finding of Fact

a. The potential air quality impacts associated with Plan actions are limited to burning of wood from demolished buildings and short-term construction generated emissions, notably dust and vehicle emissions. The North Coast Regional Air Quality Management District construction and burning requirements concerning particulate matter and smoke would ensure that construction will cause a less than significant impact to the local air quality.

b. Due to the nature of the Plan actions, a violation of air quality standards is not expected.

c. Humboldt County is currently in attainment for all criteria pollutants except particulate matter. The air pollutant potentially generated by the projects contained in the Access Plan during construction-related activities would be particulate matter. Emissions from construction vehicles would be minor because construction-related activities would be temporary.

d. Temporary and low pollutant concentrations indicate there would be no impact on sensitive receptors.

e. The project actions are not anticipated to create objectionable odors.

Mitigation and Monitoring

None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES. Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

a. Implementation of the Proposed Action, Alternative A could potentially result in the following impacts to threatened, endangered and special status species:

- Direct impacts to Humboldt Bay wallflower, beach layia and other rare dune plants could result

from pedestrians, dogs or horses leaving the trail corridor and walking within rare plant areas, potentially crushing seed and reproductive individuals. Ground disturbance associated with off-trail foot traffic may also indirectly impact rare plants by causing degradation of suitable habitat areas (i.e. dune mat).

- Special status salt marsh species, Humboldt Bay owl's-clover and Point Reyes bird's-beak, could be adversely affected by sediment transport during construction of the canoe/kayak launching ramp, which has the potential to bury seed or reproductive individuals. Other potential impacts to these species may result from an increase in foot traffic within salt marsh habitat near the proposed boat landings at Ma-le'l North.
- Temporary impacts to water quality and sediment transport within the Mad River Slough from construction of the canoe/kayak launching ramp could adversely affect five species of special status fish known to utilize the slough, namely tidewater goby, coast cutthroat trout, the southern Oregon/northern California coho salmon ESU, the northern California steelhead ESU and the California coastal Chinook salmon ESU.
- Temporary impacts to water quality caused by sediment transport associated with construction of the foot bridge over the seasonal wetland in the nearshore dunes and the wetland view deck over the freshwater/riparian swamp adjacent to railroad berm trail, both at Ma-le'l North, have the potential to adversely affect northern red-legged frog and northwestern pond turtle.
- Activities associated with the proposed action that have the potential to adversely affect special status herons and egrets (specifically great egret, great blue heron, snowy egret and black-crowned night heron), raptors (Cooper's hawk, sharp-shinned hawk, short-eared owl, northern harrier, white-tailed kite, merlin, peregrine falcon, bald eagle and osprey), and land birds (Vaux's swift, yellow warbler, black-capped chickadee, purple martin, willow flycatcher, and bank swallow) include 1) the ongoing potential for disturbance associated with routine vegetation clearing to maintain an open trail corridor through the CMA, and 2) the potential for disturbance to breeding birds associated with the expansion of the parking area at Ma-le'l North involving the removal of approximately eight young beach pines and the placement of crushed gravel.

Implementation of **Mitigation Measures 1, 2, 3, and 4** would ensure that potential adverse impacts to threatened, endangered and special status species associated with implementation of the Proposed Action, Alternative A would be less than significant.

b. Implementation of the Proposed Action, Alternative A could potentially result in the following permanent or on-going impacts to riparian and wetland habitats or other sensitive natural community:

- The displacement of approximately 60 ft^2 of wetland vegetation (i.e. wetland fill) for the installment of footings for the footbridge over the seasonal wetland in the nearshore dunes.
- The displacement of less than one square foot of wetland vegetation due to the installation of two post piles as part of the repair of the wetland view deck along the railroad berm trail at Ma-le'l North.
- Installation of the canoe/kayak landing ramp at Ma-le'l North is expected to permanently remove a minor amount of wetland vegetation (less than 300 ft^2) composed mostly of dense-flowered cordgrass with small amounts of the native pickleweed, jaumea and saltgrass. Dense-flowered cordgrass is an invasive exotic plant in Humboldt Bay that displaces native salt marsh vegetation.
- On-going impacts to native vegetation include routine vegetation clearing to maintain an open trail corridor through the CMA.

Implementation of **Mitigation Measures 1, 5, and 6** would ensure that potential adverse impacts to sensitive natural communities associated with implementation of the Proposed Action, Alternative A would be less than significant.

c. Please see answer to 'b' above.

d. Activities associated with the Proposed Action, Alternative A that have the potential to interfere with the movement of native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites include:

- The ongoing potential for disturbance to breeding birds associated with routine vegetation clearing to maintain an open trail corridor through the CMA.
- The potential for disturbance to breeding birds associated with the expansion of the parking area at Ma-le'l North involving the removal of approximately eight young beach pines and the placement of crushed gravel.
- The potential for siltation into dune swales and freshwater/riparian swamp, and the associated impacts to suitable amphibian and reptile habitat, that could result from the proposed installation of a foot bridge over the seasonal wetland in the nearshore dunes and the wetland view deck along the railroad berm trail at Ma-le'l North.
- Disturbance to potentially nesting ospreys associated with the installation of the wetland view deck near the currently active osprey nest located approximately 50 meters west of the railroad berm trail at Ma-le'l North.
- The potential for siltation into the Mad River Slough, and associated impacts to water quality and thus fish habitat, that could result from construction of the canoe and kayak launching ramp at Ma-le'l North.

Implementation of **Mitigation Measures 1 and 2** would ensure that potential interference of wildlife use of the CMA associated with implementation of the Proposed Action would be less than significant.

Mitigation and Monitoring
Based on the discussion above and the implementation of **Mitigation Measures 1-6**, the Plan would not significantly impact or adversely affect cultural resources.

Mitigation Measure 1: Planned improvements would occur during the dry season in seasonal wetlands and would incorporate Best Management Practices (BMPs) to control sediment transport, such as conducting work during low tide, and use of silt fencing if necessary.

Mitigation Measure 2: During the breeding season for birds likely to breed in the Ma-le'l Dunes Cooperative Management Area (CMA) (February 15 to August 15), construction activities and routine maintenance would utilize only non-mechanized equipment. Only hand tools and clippers would be allowed during this period, except to address emergency and/or public safety conditions when mechanized equipment would be allowed. The use of mechanized equipment within the breeding season for birds likely to breed in the Ma-le'l Dunes CMA to address emergency conditions would be conducted at the discretion of the Ma-le'l Dunes CMA managers.

Mitigation Measure 3: The USFWS will implement Humboldt Bay wallflower seed collection from existing populations on the adjacent Lanphere Dunes Unit, and subsequent dispersal within newly restored areas of the Fernstrom-Root and Ma-le'l parcels. This measure is designed to facilitate the expansion of the wallflower within the CMA and mitigate for potential adverse impacts from off-trail foot traffic. The refuge will obtain a recovery permit

Mitigation Measure 4:
All construction activities occurring within or adjacent to endangered plant areas would be supervised by Ma-le'l Dunes CMA resource managers and would take place outside of the growing season to avoid impacts to reproductive individuals. In addition, before the commencement of work and when species are clearly visible all

occurrences of Humboldt Bay wallflower rosettes (reproductive season is approximately March 1 through the end of the summer), beach layia (reproductive season is March to May), Humboldt Bay owl's-clover (reproductive season is May through July), Point Reyes bird's-beak (reproductive season is approximately June 1 through end of summer), and other rare plant species located near construction areas would be flagged and the CMA resource managers would document any adversely affected individuals.

Mitigation Measures 5:
One hundred seventy-five square feet (175 sf) of high salt marsh habitat (6.4 to 8.9 feet above mean-low-low-water) that is dominated by dense-flowered cordgrass (*Spartina densiflora*) would be restored with pickleweed (*Salicornia virginica*) and saltmarsh (*Distichlis spicata*) and maintained as such as mitigation for the installation of the canoe/kayak landing/launching ramp.

Mitigation Measures 6:
The development of a maintenance program for the forest trails in Ma-le'l North to ensure that routine vegetation clearing does not adversely affect locally rare plants identified by the CMA resource managers.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
V. CULTURAL RESOURCES. Would the Plan:				
a. Cause a substantial adverse change in the significance of a historical resource or historic property on the National Register of Historic Places, the California Register of Historic Places, or a local register of historic resources?	☐	☐	☐	☒
b. Cause a substantial adverse change in the significance of an archaeological resource or historic resource (as per CEQA) or an adverse effect on an historic property (as per NHPA. Sec. 106)?	☐	☒	☐	☐
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Finding of Fact

a. Archaeological and ethnographic investigations have been conducted within the Plan area from the early 1900's to the present, and most recently by BLM and FWS upon acquisition of the respective properties (USDI-BLM 1988. Archeological Field Examination, Survey Unit Record, Lingren Parcel, Manila, CA: USDI-BLM 1991. Archeological Field Examination, Survey Unit Record, Mad River Slough and Dunes Management Area, Arcata, CA. USDI-BLM 1992. Memorandum 8100 AR-49 CA-056 Archeological Field

Examination, Survey Unit Record, Manila Dunes, Arcata, CA. Angeloff, et al 2004. A Cultural Resources Overview and Inventory of Selected parcels of the US Fish and Wildlife Service Humboldt Bay National Wildlife Refuge, Lanphere Dunes and Proposed Ma-le'l Dunes Unit, Humboldt County, CA, Roscoe & Associates and Table Bluff Reservation-Wiyot Tribe. Arcata, CA). As a result of these research efforts, twelve (12) pre-contact Wiyot and Old Nation use areas have been identified and several isolated stone tools have been found and recorded. In addition, several historic places have been located, and the historic Hammond Lumber Company's railroad grade is the structural foundation for the road and trail along the slough margin of the Ma-le'l Dunes CMA. Historic archaeologists and historians have determined and documented their findings that some of the historic resources located within the Ma-le'l Dunes CMA may be eligible for the National Register of Historic Places (Grangaard, M. USD-BLM-Arcata Field Office, Archaeologist, personal communication with Laura Kadlecik of HWR Engineering & Science, June 16, 2006). In addition, a cultural resources report was requested from the North Coast Information Center to determine if any cultural sites exist within the area of the proposed Plan. The results of the search indicate a high probability of finding sites or other evidence of human historic in or near the Plan area. The records review reported that 30% of the Plan area has been surveyed.

b. There is a possibility that increased foot traffic near cultural sites or wandering from the delineated trails system by the public could negatively affect the cultural resources of the area as a result of the proposed Plan. Working with the Wiyot Tribe's cultural resources specialist all trails within the Ma-le'l Dunes CMA were placed to avoid potential impacts to cultural resources. Despite the fact that proposed improvements have been sited in order to avoid impact to cultural resources, there is a possibility that visitors could still wander from the trail causing damage to cultural resources or undiscovered buried archaeological or historic resources. Additionally, these resources could be encountered during the installation of proposed improvements. The following mitigation measures were developed to reduce the potential impacts to less than significant.

c. The project will not result in directly or indirectly destroying or impacting a unique paleontological resource or site of unique geologic features.

d. As a result of the high probability of finding sites or other evidence of human cultural activity in the Plan area, there is a possibility that undiscovered, buried archeological or historic resources could be encountered during the proposed construction activities. **Mitigation Measure 7** provides provisions to protect cultural resources in the event that any archeological subsurface resource(s) are discovered pursuant to the North Coast Information Center recommendations and under the suggested guidelines of the California Indian Heritage Commission.

Mitigation and Monitoring

Based on the discussion above and the implementation of **Mitigation Measures 7-10**, the Plan would not significantly impact or adversely affect cultural resources.

Mitigation Measure 7:

In the event any undiscovered paleontological, archaeological, ethnic, or religious resources are encountered during grading or construction-related activities, in compliance with the state and federal law, all work within 100 feet of the resources shall be halted and the Plan applicants shall consult with a registered professional archaeologist and designated representative of the Wiyot Tribe to assess the significance of the find and formulate further mitigation. This would include coordination with the Native American Heritage Commission. The Native American Heritage Commission would contact the Wiyot Tribe, as deemed necessary, to assist in assessing the significance of any find. If any find is determined to be of significance, the USDI-BLM and FWS, and a qualified archaeologist would meet to determine the appropriate course of action. Pursuant to the California Health and Safety Code Section 7050.5, if human remains are encountered, all work would cease and the County coroner would be contacted. The county coroner and Native American Heritage Commission would be charged with determining if the human remains are of Native American origin.

Mitigation Measure 8:

Cultural monitors will be present during initial, native soil disturbance activities that occur at locations mutually

agreed upon by the Wiyot Tribe, USFWS, and BLM (as necessary) as areas of the greatest concern.

Mitigation Measure 9:
Regulatory signing would state that in accordance to state law, destruction, and defacement of historical objects (Penal Code 655-1/2 and relevant federal law) and removal of human remains (PRC 5097.5, PRC 70550.5, and relevant federal law) is a punishable crime. Undesignated canoe and kayak landings located on the slough and within the project boundary would be re-vegetated and signed "No Landing/Re-vegetation in Progress."

Mitigation Measure 10:
USFWS, BLM (as necessary), and the Wiyot Tribe would work collaboratively with a registered professional archaeologist to prepare a baseline review of the cultural resources that the Tribe and agency staff mutually agrees upon as the areas of greatest concern. Thereafter annual review with a registered professional archaeologist or designated representative of the Wiyot Tribe would occur. Furthermore, Ma-le'l Dunes CMA managers would conduct regular monitoring to ensure against vandalism of cultural resources within mutually agreed upon areas of greatest concern. Results of cultural resources monitoring would be conveyed to the appropriate agencies.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VI. GEOLOGY AND SOILS. Would the Plan:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
1. Rupture of a known earthquake fault?	☐	☐	☒	☐
2. Strong seismic groundshaking?				
3. Seismic-related ground failure, including liquefaction?				
4. Landslides?				
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the Plan and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☒
d. Be located on expansive soil creating substantial risks to life or property?	☐	☐	☐	☒
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the	☐	☐	☐	☒

disposal of wastewater?

Finding of Fact

a. The Plan is in an area that is subject to landslides due to the nature of moving sand dunes, which have large elevation changes. The proposed Plan is susceptible to impacts associated with seismic events (ground shaking and liquefaction) and structures could be lost during a seismic event. Structures would be engineered to withstand seismic events to the extent practicable; therefore, the threats to human life and structures are expected to be less than significant. Additionally, no significant infrastructure except for a view dock would be located on soils that are not subject to landslide and large elevation changes. The view deck, if determined feasible once environmental restoration of the surrounding is complete, will be designed to meet uniform building code with special attention to seismic considerations.

b. Most trails outlined in the Access Plan consist of existing trails. Casual trails would be re-vegetated. One existing trail has some erosion, which is addressed in the access Plan. All new trails would be designed to prevent loss of topsoil and soil erosion.

c. Plan actions would not locate significant structures, such as buildings or roads, on a geologic unit or soils that are unstable, or that would become unstable as result of the Plan. Soil studies would be conducted prior to construction of structures to determine site suitability.

d. Plan actions would not locate a structure on expansive soils. Soil studies would be conducted prior to construction of structures to determine site suitability.

e. The site is not associated with wastewater treatment or disposal, and no effluent discharges are planned under the proposed Plan. The Access Plan proposes a vault toilet system, which would be self-contained and periodically serviced for the disposal of wastewater.

Mitigation and Monitoring

None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VII. HAZARDS AND HAZARDOUS MATERIALS.				
Would the Plan:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c. Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed	☐	☐	☐	☒

school?				
d. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e. Be located within an airport land use Plan area or, where such a Plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f. Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g. Impair implementation of or physically interfere with an adopted emergency response Plan or emergency evacuation Plan?	☐	☐	☐	☒
h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☒	☐
i. Expose people or structures to a significant risk of loss, injury, or death involving tsunamis?				

Finding of Fact

a. Except for construction materials, the Plan would not require the transport or use of hazardous materials. Typical construction-related materials, such as fuels and oils, would be used during construction. Construction workers may therefore be exposed to dust or emissions containing these materials. This impact is considered temporary and less than significant. Standard construction procedures would be implemented to reduce the emissions of dust or other pollutants during the proposed Plan. If potentially contaminated areas are encountered during construction qualified personnel would evaluate the area in the context of applicable local, state, and federal regulations governing hazardous waste. Handling and storage of fuels, flammable materials, and common construction-related hazardous materials are governed by California Occupational Safety and Health Administration (Cal/OHSA) standards for storage and fire prevention.

b. Plan actions do not present a significant hazard to the public or environment involving the release of hazardous materials.

c. The Plan actions are not in the vicinity of any existing or proposed schools.

d. Please see response to 'a' above.

e. Although airports are located in the region, there are no commercial or private airports/airstrips within the vicinity of projects contained in the Access Plan. The Plan would pose no significant safety hazard for people working or residing in the area as no lighting systems, sources of glare, tall structures, or significant sources of noise are associated with the Plan.

f. Please see response to 'e' above.

g. The Plan would not interfere with the adopted emergency response plan or emergency evacuation plan because construction-related activities would be located off the primary road network.

h. Implementation of the Plan would not expose people or structures to a risk of wildland fires because the Plan area does not contain nearby urbanized areas or flammable wildlands. Any potential increase in fire hazards due to construction activities at the Plan site would be minimized because construction staff would adhere to all rules and regulations regarding the handling and storage of fuels and flammable materials.

i. The proposed Plan would expose people to the risks associated with the event of a tsunami. The event of tsunami would primarily affect people that would be located on the nearshore dune complexes directly facing the Pacific Ocean. A tsunami striking other areas in the Ma-l'el CMA would have to overtop the approximate 90 foot elevations of the dune complexes. Evacuation from the project site is the only viable means for protecting human life. The nearest point above the likely tsunami flooding level is the top of the nearshore dunes which, at 90 feet appear to represent a reasonable protection from risk associated with tsunami inundation. Planned ignage at the parking areas would address all safety requirements for the risks associated with a tsunami.

Mitigation and Monitoring

None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VIII. HYDROLOGY AND WATER QUALITY. Would the Plan:				
a. Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level?	☐	☐	☐	☒
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	☐	☐	☐	☒
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	☐	☐	☐	☒
e. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or	☐	☐	☒	☐

	provide substantial additional sources of polluted runoff?			
f.	Otherwise substantially degrade water quality?	☐	☐	☒	☐
g.	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h.	Place within a 100-year flood hazard area structures that would impede or redirect floodflows?	☐	☐	☐	☒
i.	Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j.	Contribute to inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Finding of Fact

a. Construction activities proposed under the Plan would not result in any violations of water quality standards or waste discharges. Additionally, all construction activities possibly affecting water quality would be mitigated to a less than significant amount through the use of California Stormwater Quality Association's Stormwater Best Management Practice (BMP) Handbooks. Construction of the pedestrian footbridge over a seasonal wetland would take place during the dry season thereby avoiding impacts to water quality.

b. The Plan does not call for any use of the areas groundwater resources. Level to groundwater varies throughout the Plan area. The soils within the Plan area are highly permeable, and no impact on groundwater recharge is anticipated.

c. Plan actions would not alter existing drainage patterns. Additionally, erosion control planning on hiking trails is designed to prevent further erosion of the Plan area.

d. Plan actions would not alter existing the drainage patterns. Erosion control design and planning on hiking trails would prevent flooding.

e. There are no existing or planned stormwater drainage systems within the Plan area.

f. Impacts of the proposed Plan on water quality are generally associated with construction and are expected to be temporary. The replacement of the wetland viewing deck and construction of the canoe and kayak landing and launching ramp would potentially disturb water quality on a temporary basis. Additionally, construction of the erosion control revetment along the railroad berm trail could possibly impact water quality due to its vicinity to the Mad River Slough. All construction activities possibly affecting water quality would be mitigated to a less than significant amount through the use of California Stormwater Quality Association's Stormwater Best Management Practice (BMP) Handbooks. Construction of the pedestrian footbridge over a seasonal wetland would take place during the dry season thereby avoiding impacts to water quality. Typical stormwater pollutants from parking lots are hydrocarbons and metals. In gravel parking lots the constituents are typically adsorbed and sequestered within the gravel media and therefore pose little potential risk to downstream receptors. Expansion of the Ma-le'l North parking area would be constructed using gravel, which is semi-permeable. Soil in the vicinity of the site is highly permeable. The design would include best management practices proposed in the Plan that would reduce erosion and non-point source pollution, and that meet the design guidelines and performance criteria of the California Stormwater Quality Association's Stormwater Best Management Practice (BMP) Handbooks.

All projects proposed under the Plan that could potentially affect water quality will have to acquire several

permits including NCRWQCB Section 401 Water quality certification, USACE Section 10 and Section 404 permit for filling or dredging of water of the United States, Humboldt Bay Harbor, Recreation and Conservation District encroachment permit for projects in tidelands below Mean High Water Elevations, California Coastal Commission Section 307 permit for projects located within the Coastal Zone, and State Water Resources Board General Construction Water Discharge Requirements for construction activities covering over one acre.

g. There are no housing projects contained in the Access Plan.

h. Portions of the Plan may be located within the 100-year flood hazard area. However, there are no structures that would impede or redirect flows.

i. The Plan is not expected to expose people to hazards from flood events or inundation.

j. The project area is within the tsunami hazard area due to its location adjacent to the Pacific Ocean. However, a tsunami event would not expose people to the risks associated with inundation due to the high elevations of the sand dunes.

Mitigation and Monitoring

Based on the discussion above and the implementation of **Mitigation Measures 1**, the Plan would not significantly impact or adversely affect hydrology and water quality.

Mitigation Measure 1: Planned improvements would occur during the dry season in seasonal wetlands and would incorporate Best Management Practices (BMPs) to control sediment transport, such as conducting work during low tide, and use of silt fencing if necessary.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
IX. LAND USE AND PLANNING. Would the Plan:				
a. Physically divide an established community?	☐	☐	☐	☒
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☒	☐

Finding of Fact

a. The Plan would not divide an established community.

b. The Plan does not conflict with any applicable land use plans, policies or regulations adopted for the purpose of avoiding or mitigating an environmental effect.

c. The project area is included in the planning area of Recovery Unit 1 of the western snowy plover Pacific

Coast Population Draft Recovery Plan (2001), and the recovery plan for seven coastal plants and the Myrtle's silverspot butterfly (1998). The Plan would not conflict with any habitat conservation plans or natural community conservation plans if permits are acquired that will comply with the requirements of the Recovery Unit 1 of the western snowy plover Pacific Coast Population Draft Recovery Plan (2001) and the recovery Plan for seven coastal plants and the Myrtle's silverspot butterfly (1998). These permits would include the United States Fish and Wildlife Service/ National Marine Fisheries Service Section 7 Consultation for the Biological Assessment, National Marine Fisheries Service Section 305 Consultation concurrent with Section 7, United States Fish and Wildlife Service Federal Migratory Bird Treaty Act consultation; and the California Department of Fish and Game Section 2080 consultation for species that are federally protected, Fish & Game Code Sections 3511, 4700, 5050 and 5515 for fully protected animals consultation, and Fish & Game Code Sections 3503 and 3503.5 Bird Nest Protection such as osprey consultation.

Mitigation and Monitoring
None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
X. MINERAL RESOURCES.				
Would the Plan:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Findings of Fact

a. The Plan would not result in a loss of mineral resource.

b. The Plan site is not designated as an important mineral resource recovery site in local plans.

Mitigation and Monitoring
None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XI. NOISE. Would the Plan:				
a. Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?	☐	☐	☐	☒

b. Expose persons to or generate excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c. Result in a substantial permanent increase in ambient noise levels in the Plan vicinity above levels existing without the Plan?	☐	☐	☒	☐
d. Result in a substantial temporary or periodic increase in ambient noise levels in the Plan vicinity above levels existing without the Plan?	☐	☐	☒	☐
e. Be located within an airport land use Plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the plan area to excessive noise levels?	☐	☐	☐	☒
f. Be located in the vicinity of a private airstrip and expose people residing or working in the Plan area to excessive noise levels?	☐	☐	☐	☒

Finding of Fact

a. Construction would be expected to generate short-term elevation of noise levels but would not violate noise standards for nearby communities.

b. Residents near the Plan actions would not be exposed to excessive ground vibration or ground borne noise levels.

c. The Plan would increase the number of people visiting in the Plan area. Subsequently there would be an increase in ambient daytime noise levels related to people's conversations, vehicular engines, and vehicle doors closing. However, these levels are not expected to exceed ambient noise levels of outdoors speech interference thresholds of 60 to 70 dBA.

d. The projects of the proposed Plan would generate short-term elevations of noise levels but not to levels that would violate noise standards in the Humboldt County General Plan or any other applicable standards. Noise levels from construction activities would be short-term and not permanently increase ambient noise levels.

e. Although airports are located in the region, there are no commercial or private airports/airstrips within the vicinity of projects contained in the Access Plan. The project would not expose people working or residing in the area to excessive noise levels.

f. Please see answer to 'e' above.

Mitigation and Monitoring
None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XII. POPULATION AND HOUSING. Would the Plan:				
a. Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b. Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c. Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Finding of Fact

a. The Plan would not induce population growth because the Plan does not provide new homes or businesses or provide for the expansion of facilities that induce growth.

b. The Plan would not result in the displacement of any housing units or people. Consequently, there would be no population and/or housing impacts associated with the Plan.

c. Please see answer to 'b' above.

Mitigation and Monitoring
None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIII. PUBLIC SERVICES.				
Would the Plan:				
a. Result in substantial adverse physical impacts associated with the provision of				

new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Finding of Fact

a. As there would be no increase in human population resulting from the Plan, service ratios and response times of local fire protection would not be impacted. Demand for schools and other public facilities would not change. However, the Plan could increase the area for law enforcement jurisdiction of the Humboldt County Sheriffs Department and BLM law enforcement section. Visitor management tasks associated with visitor use would be the responsibility of BLM and USFWS. Both BLM and USFWS have committed staff to patrol the area and there would be an onsite resident caretaker. Additionally, the Plan proposes that BLM and USFWS will work internally with the Sheriff's department to develop a law enforcement protocol, such that the increase will be accommodated. Potential impact to local law enforcement should be less than significant.

Mitigation and Monitoring
None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIV. RECREATION. Would the Plan:				
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☒	☐

Finding of Fact

a. The Redwood Gun Club is located directly adjacent to the properties that are contained in the Access Plan.

The project could potentially increase use of this facility; however, the increase cannot be estimated.

b. The Plan includes construction and expansion of recreational facilities. All new facilities, including construction and expansion of trails, would be designed to avoid adverse impacts on the physical environment. Potential impacts from the construction and use of these facilities and proposed mitigations are explained in detail in the Biological and Cultural Resources and Hydrology and Water Quality Sections of this analysis.

Mitigation and Monitoring
None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XV. TRANSPORTATION/TRAFFIC. Would the Plan:				
a. Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in the number of vehicle trips, the volume to-capacity ratio on roads, or congestion at intersections)?	☐	☐	☒	☐
b. Cause, either individually or cumulatively, exceedance of a level-of-service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d. Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e. Result in inadequate emergency access?	☐	☐	☐	☒
f. Result in inadequate parking capacity?	☐	☐	☒	☐
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒

Finding of Fact

a. Traffic would increase on Young Lane (a county road) and on the access road (owned by USFWS), relative to the existing traffic. Casual observation indicates that currently, public access and associated traffic is limited to no more than ten cars a day, which park at the existing Ma-le'l South/BLM parking area, or just outside the USFWS gate. Signage, advertisements, and a public opening would encourage additional visitors

to the area. However, the Plan actions are designed to accommodate this increase. The increase in traffic would not significantly impact the load or capacity of Young Lane.

b. See answer to 'a' above.

c. The Plan would not affect air traffic patterns.

d. The Plan would continue to use gravel road access and gravel parking areas. Due to the limited width of the access road, signage would be required to remind drivers to obey the speed limit and to be aware of pedestrian and foot traffic. Within the parking areas there would be landscape barriers that separate pedestrian use from automobiles. Incorporation of these design features should not significantly increase hazards associated with transportation/traffic.

e. The proposed Plan would improve access to the Ma-le'l Dunes area during daylight hours. Emergency access at nighttime hours would be accommodated by providing keys to the locked gates to appropriate law enforcement officers and emergency services.

f. The Plan proposes to expand and improve parking as well as provide areas where parking can be expanded. Therefore, the Plan would not result in inadequate parking facilities.

g. Improved access to the Ma-le'l Dunes Area by alternative modes of transportation is included in the proposed Plan. The Plan would not conflict with adopted policies, plans, or programs supporting alternative transportation.

Mitigation and Monitoring
None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVI. UTILITIES AND SERVICE SYSTEMS. Would the Plan:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?	☐	☐	☐	☒
e. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the projects	☐	☐	☐	☒

	projected demand in addition to the providers existing commitments?			
f.	Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs?	☐	☐	☐	☒
g.	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Finding of Fact

a. The proposed Plan would not release any wastewater discharges due to the fact that the Plan proposes to install vault toilets, which are self-contained and requires minimal pumping.

b. The site is not associated with wastewater treatment or disposal and no effluent discharges are planned under the proposed Plan. The Plan proposes a vault toilet system for the disposal of wastewater, which is contained and periodically serviced.

c. The expansion of the parking facilities and improvement to the access road included in proposed Plan could potentially impact stormwater drainage. As described in the Hydrology section, the parking lot design would include BMP's that reduce erosion and non-point source pollution, and would meet the design guidelines and performance criteria of the California Stormwater Quality Association's Stormwater Best Management Practice (BMP) Handbooks. Typical stormwater pollutants from parking lots are hydrocarbons and metals. In gravel parking lots the constituents are typically absorbed and sequestered within the gravel media and therefore pose little potential risk to downstream receptors.

d. A water line to the caretaker area currently exists and no new or expanded entitlements are needed.

e. Please see answer to 'b' above.

f. The minimal increases in solid waste generated by the projects contained in the Access Plan are expected to have no impact on the Humboldt Waste Management Authority's (HWMA) transfer station, which is currently operating at 350 tons per day below its capacity.

g. The projects contained in the access would comply with all federal, state, and local regulations, including those pertaining to solid waste.

Mitigation and Monitoring

None Required

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVII. MANDATORY FINDINGS OF SIGNIFICANCE				
a. Does the Plan have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered	☐	☒	☐	☐

plant or animal, or eliminate important examples of the major periods of California history or prehistory?				
b. Does the plan have impacts that are individually limited but cumulatively considerable? ('Cumulatively considerable' means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☒	☐
c. Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Finding of Fact

a. The analysis in this Environmental checklist shows that the project as described, and with the proposed mitigation measures, will have no substantial adverse effects or significant impacts on the environment, fish or wildlife, or on people. Mitigation measures have been added to prevent significant impacts and to minimize already less than significant impacts in the following categories: biological resources, cultural resources, and hydrology and water quality. The mitigation measures recommended will reduce any potential impacts, either directly or indirectly, to a level that is considered less than significant

b. Implementation of the proposed project will not add appreciably to any existing or foreseeable future significant cumulative impact, such as species endangerment, or wetland loss. Incremental impacts, if any, will be negligible and undetectable. One unique and fortunate characteristic of the proposed project is that the roadway, parking areas, and most of the forest and dune trails already exist within the Plan area and need only be upgraded, improved upon, repaired, signed, and/or marked in order to accommodate safe and orderly public use. The continued increase of open public recreational opportunities along the beach and dunes of the north spit and the development of additional housing nearby have the potential to cause cumulative impact to the biological and cultural resources located within the Plan area. However, the continuation of planned and coordinated restoration efforts, particularly those that benefit threatened, endangered, or special status species and habitats, will limit any considerable cumulative impact to less than significant.

c. Please see answer “a” above.

Biological Assessment
For The
Ma-le'l Dunes Cooperative Management Area Public Access Plan

November 2006

Prepared By:
Mad River Biologists
920 Samoa Blvd., Suite 210
Arcata, CA 95521

With Assistance From:
HWR Engineering and Science
P.O. Box 165
Arcata, CA 95518

Prepared For:

12/11/06
Date

Samuel Schuchat, Executive Officer
State Coastal Conservancy
1330 Broadway, 11th Floor
Oakland, CA 94612

In Consultation with and Approved by:

12/6/06
Date

Eric T. Nelson, Refuge Manager
United States Fish and Wildlife Service
Humboldt Bay National Wildlife Refuge
1020 Ranch Road
Loleta, CA 95551

11-27-06
Date

Lynda Roush, Arcata Field Manager
United States Bureau of Land Management
Arcata Field Office
1695 Heindon Road
Arcata, CA 95521-4573

Table of Contents

Introduction 1

Critical Habitat 1

Consultations to Date 1

Current Management Direction 1

- Bureau of Land Management – Ma-le'l South 2
- U.S. Fish and Wildlife Service – Ma-le'l North 2
- Cooperative Management Goals 2

Description of Proposed Action (Alternative A) 3

- Public Uses: 3
- Access and Circulation: 4
- Access Infrastructure: 4
- Access Management: 5
- Minimization Measures: 6
  - *Endangered Plants* *6*
- Conservation Recommendations 8
  - *Western Snowy Plover* *8*
  - *California Brown Pelican* *9*

Action Area 9

- Endangered Plants 9
- Dune Mat 10
- Dune Swale 10
- European Beachgrass 11
- Lupine–Coyote Brush Scrub 11
- Open Sand Areas 12

Species Accounts and Status within the Action Area 12

- Humboldt Bay Wallflower 12
- Beach Layia 14
- Western Snowy Plover 16
- California Brown Pelican 17

Effects of the Proposed Action 18

- Endangered Plants 18
- Western Snowy Plover 20
- California Brown Pelican 20

Cumulative Effects 20

Analysis of Alternative Actions 21
Alternative B: Multi-Use Throughout and Additional Improvements 21
Public Uses: *21*
Access Infrastructure: *21*
Analysis of Alternative B *21*
Alternative C: Protection and Restoration 22
Analysis of Alternative C *22*
Alternative D: No Action 22
Analysis of Alternative D *23*
Conclusions and Determinations 23
Humboldt Bay Wallflower 23
Beach Layia 23
Western Snowy Plover 23
California Brown Pelican 23
Bibliography 24

List of Figures

Figure 1 Site Location Map
Figure 2 Ma-le'l Dunes CMA Map
Figure 3 Existing Vegetation Habitat Types at the Ma-le'l Dunes CMA
Figure 4 Federally Listed Plant Species at the Ma-le'l Dunes CMA

Introduction

The purpose of this biological assessment is to review the proposed Ma-le'l Dunes Cooperative Management Area Public Access Plan in sufficient detail to determine to what extent the proposed action may affect any of the Threatened or Endangered species listed below. This biological assessment is prepared in accordance with legal requirements set forth under section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1536 (c)).

Species lists were requested from the United States Fish and Wildlife Service (USFWS) Arcata Field Office website and a list of endangered, threatened proposed and candidate species was generated for the Eureka and adjacent (Tyee City, Arcata North, Arcata South, McWhinney Creek, Fields Landing and Cannibal Island) 7.5 minute United States Geological Survey (USGS) quadrangles on 17 January, 2006 (Document numbers 631592170-105313, -105429, -105639, -105649, -105719, -105742, and -105810). The California Natural Diversity Data Base (CNDDB) was also queried for the project region in January of 2006.

The following species are considered in this document:

Humboldt Bay wallflower (*Erysimum menziesii* ssp. *eurekense*)	**Endangered**
Beach layia (*Layia carnosa*)	**Endangered**
Western snowy plover (*Charadrius alexandrinus nivosus*)	**Threatened**
California brown pelican (*Pelicanus occidentalis californicus*)	**Endangered**

Critical Habitat

The action addressed within this biological assessment does not fall within Critical Habitat for western snowy plover. Final ruling on Critical Habitat for western snowy plover was established by the USFWS on September 29, 2005 (USFWS 2005).

Critical Habitat has not been designated for Humboldt Bay wallflower, beach layia or California brown pelican. California brown pelican has been proposed for removal from the Endangered Species List.

Consultations to Date

There has been no formal consultation to date.

David Imper, USFWS Ecologist from the Arcata Field Office, was informally consulted on February 15, 2006 regarding the status of the federally endangered western lily (*Lilium occidentale*) within the action area. Mr. Imper concurred that the proposed action will have no effect on western lily, considering that no occurrences of this species are known from the Ma-le'l Dunes CMA and suitable habitat is limited.

Current Management Direction

The 444-acre Ma-le'l Dunes Cooperative Management Area (CMA) consists of parcels owned by the Bureau of Land Management (BLM) and the USFWS. Therefore, the proposed action must be undertaken within the framework of the ESA policies of both federal agencies. Both the BLM and the USFWS share common goals for cooperatively developing and managing their respective properties

for public access, which include protecting the natural and cultural resources of the area while providing public access for recreation, education and research activities.

Bureau of Land Management – Ma-le'l South

The Ma-le'l Dunes CMA falls within the BLM's Samoa Peninsula Management Area under the guidance of the BLM Arcata Resource Management Plan. The agency's overarching mission is to sustain the health, diversity and productivity of public lands for the use and enjoyment of present and future generations. General management guidance for the BLM's resource programs is derived from laws, Executive Orders, regulations, Department of Interior manuals, BLM manuals, and instruction memoranda (Washington and California State Offices). Together, these form the basis for management decisions concerning the public land resources and programs managed by the Arcata Field Office. General management policy for the Arcata Field Office is also provided by the federal Land Policy and Management Act. All BLM actions are subject to the National Environmental Policy Act, the Clean Water Act and the Endangered Species Act.

Although the agency operates under a multiple-use mandate, the 154-acre BLM-owned portion of the Ma-le'l Dunes CMA (Ma-le'l South) will allow for limited recreational activities as defined in their Arcata Resource Management Plan and subsequent amendments, which recommends actions for resource protection and provisions for public and recreational use on both the north and south spits of Humboldt Bay, and on the uses outlined in the Ma-le'l Dunes Public Access Plan (HWR 2006, USDI-BLM 2004b).

U.S. Fish and Wildlife Service – Ma-le'l North

The 290-acre USFWS-owned portion of the Ma-le'l CMA (Ma-le'l North) comprises the Ma-le'l Dunes Unit of the Humboldt Bay National Wildlife Refuge (HBNWR). The mission of the HBNWR is to protect fish and wildlife resources of national importance while providing opportunities for the public to appreciate and enjoy the natural heritage of the Humboldt Bay region. Along with other public and private lands around Humboldt Bay, the lands of the HBNWR are key stopover points for millions of birds that migrate along the Pacific Flyway. The refuge also includes the Lanphere Dunes Unit, which is adjacent to the CMA at its northern border. As noted in the Ma-le'l Dunes Public Access Plan "the refuge contains the most pristine remaining dune ecosystem in the Pacific Northwest and supports rare and representative examples of older forested dunes, young active dunes, dune swale wetlands, and coastal salt marsh (EDAW 2006)." The enabling legislation for the Lanphere and Ma-le'l Dunes Units include the Endangered Species Act, in recognition of the need for protection of endangered species and their habitats.

Additional management guidance for the proposed action is also provided by the Recovery Plan for the Seven Coastal Plants and the Myrtle's Silverspot butterfly, the Humboldt Beach and Dunes Management Plan (1995) and the US Fish and Wildlife Service (USFWS) Conceptual Management Plan for the Lanphere Dunes Unit, Humboldt Bay National Wildlife Refuge.

Cooperative Management Goals

The proposed action is consistent with all of the above-listed policies and resource/land management plans as well as with the goals of the California State Coastal Commission (SCC) which are to "protect, restore and enhance coastal resources and to provide access to the shore". In addition, the proposed action will adhere to any interagency agreements that may be entered into to facilitate cooperation and coordinated management of the Ma-le'l Dunes CMA.

The following cooperative agreements would be established:

- Agreement between BLM, USFWS, and the Redwood Gun Club;
- Agreement between BLM, USFWS, and the Wiyot Tribe;
- Agreement between USFWS and Sierra Pacific;
- Agreement between BLM and Friends of the Dunes.

The proposed access plan includes goals to accommodate safe and orderly public access and a range of recreational opportunities that minimize, to the extent practicable, any adverse impacts to the natural and cultural resources of the area. Toward this end, the following objectives have been proposed in the plan:

- Incorporate the minimal public access facility improvements necessary to support recreational activities such as hiking, sightseeing, wildlife viewing and photography, picnicking, dog walking, horseback riding, and Americans with Disabilities Act (ADA) accessibility;
- Incorporate provisions for the safety and well-being of visitors to the area;
- Minimize impact to native dune plant communities, coastal wetland habitat, salt marsh habitat, populations of endangered Humboldt Bay wallflower and beach layia, and cultural resources;
- Include interpretive information that fosters public awareness and appreciation of the area's natural and cultural resources via local publications, educational brochures, and wayside exhibits;
- Intensively manage for increased visitor use levels over the next 10 years;
- Suggest format and content of cooperative management agreements between agencies and organizations involved in planning, management, enforcement, biological research and public outreach;
- Identify strategies for implementing and maintaining public access to the area;
- Identify potential sources of funding for recommended infrastructure improvements.

Description of Proposed Action (Alternative A)

The proposed action, as described in the Ma-le'l Dunes Cooperative Management Area Public Access Plan, is to provide a range of public uses with minimum improvements to facilitate safe and orderly public access to the Ma-le'l Dunes CMA for recreation, education, and research activities (HWR 2006). Although currently open to the public, recreational use and public access improvements at Ma-le'l South were approved and implemented on an interim basis (USDI-BLM 2004a, USDI-BLM 2004b). Some of the pedestrian trails and beach access through the nearshore dunes of Ma-le'l South (where sensitive biological resources are present) are not currently delineated and pedestrian – vehicle conflicts exist along the access road. Pedestrian trails and beach access through the nearshore dunes of Ma-le'l North (where sensitive biological and cultural resources are present) are also not delineated and much of Ma-le'l North completely lacks amenities to support safe public access.

The proposed action (preferred alternative) has the following design features, which are presented in the categories of public use, access and circulation, access infrastructure, and access management.

Public Uses:

- Overnight camping would be prohibited, except as allowed at Ma-le'l South for special events, on a case by case basis that meet specific criteria;
- Fire would be allowed only in designated sites at Ma-le'l South;

- Motorized vehicle use outside of roadways and parking areas would not be allowed except in an emergency or for authorized maintenance, construction, restoration, or research purposes;
- Environmental restoration activities would continue;
- Educational field trip access would continue and increase;
- Firearms, crossbow/bow shooting, mineral sales, and livestock permits and leases would continue to be prohibited;
- Continued and increased pedestrian use and associated activities would be allowed only on 5,250 feet (~1 mile) of designated trails, open sandy areas, and on the wave slope;
- Continued and increased equestrian use would be allowed on 4,200 feet (0.8 miles) of designated trails and the wave slope on Ma-le'l South. Horses will not be allowed on Ma-le'l North;
- New pedestrian use would be allowed on 18,300 feet (3.5 miles) of newly designated and/or improved existing casual trails in the nearshore dunes and forest;
- Continued and increased off-leash dog walking would be allowed on designated trails and open sands throughout Ma-le'l South and along the wave slope. Dogs would continue to be required to be leashed in the Ma-le'l South parking/picnic area. Dogs would not be allowed on Ma-le'l North;
- Group camping may be allowed on a case by case basis at the Ma-le'l South Special Event Area based on specified criteria;
- Continued, new, and increased vegetative gathering for personal use from designated forest trails would be allowed by the general public from May to November in Ma-le'l South only, and otherwise by special permit on a case by case basis;
- Continued, new, and increased vegetation gathering for personal use by tribal members would be allowed in accordance with a memorandum of agreement with the Wiyot Tribe;
- Canoe and kayak launching and landing would be allowed in designated locations only;
- Access for people with disabilities would be provided at the Ma-le'l North and South parking and picnic areas and restrooms, and along approximately 2,800 feet (0.5 mile) of trail.

Access and Circulation:

- Continued existence and increased use of the improved Ma-le'l South day use/picnic area would be allowed;
- The existing gravel access road leading to the designated parking areas in both Ma-le'l North and Ma-le'l South would be improved and resurfaced. The road would remain "one lane" at 16-20 feet in width. Measures to improve road safety, drainage and durability would include: construction of "pull outs" in areas where no fill in wetlands or bank cuts are required, a turning radius at the Young Lane – access road intersection to accommodate vehicle turn-around, and gutter sections along roadway where needed;
- Pedestrians, bicycles, and motorists would be notified, through signing, to be aware of each other and to use caution along the road.

Access Infrastructure:

- Dilapidated structures, remnant posts, and wire fencing would be removed.
- The boundary fence along the shared BLM/Ma-le'l South and USFWS/Ma-le'l North property line would be removed.

- The casual parking area adjacent to the Pacific, Gas, and Electric high voltage transmission line/tower would be closed.
- The gate located near the high voltage tower would be moved approximately 80 feet south, closer to the Young Lane-access road intersection.
- The existing wetland view deck would be re-constructed.
- New improvements to the Ma-le'l South day use picnic area would include the installation of a water spigot for equestrian use, and a bicycle rack.
- A 1,000-foot pedestrian safety corridor along the access road would be installed.
- The existing caretaker trailer pad and surrounding area would be improved. This would entail re-grading of the pad area, placement of base gravel, and vegetation clearing.
- The Ma-le'l North parking/day use picnic area would be enlarged and re-oriented to accommodate increased use, and would be re-surfaced with crushed gravel. It would also be upgraded to include: Ten motorized vehicle spaces and bus parking with one ADA vehicle space, with expansion of the parking area for nine additional motorized vehicle spaces.
- A kayak and canoe ramp measuring approximately 8 feet wide and 35 feet long would be installed at the Ma-le’l North parking/day use picnic area.
- A bicycle rack, information kiosk, picnic tables, trash and recycling receptacles, and an ADA accessible vault toilet would be installed at the Ma-le’l North parking/day use picnic area.
- 2,800 ft. (0.5 miles) of ADA compatible surfacing would be installed along the railroad berm trail. Trailhead steps, cable steps, and wooden steps and rail would be installed at various locations along trail ways.
- Casual trails though out the project area would be taken out of use and re-vegetated.
- 7,000 feet (1.3 miles) of new beach access trails and 11,300 feet (2.1 miles) of new forest trail would be delineated and marked with trail markers.
- A 15-foot long footbridge would be installed over a seasonal wetland area along a beach access trail.
- An 8-foot by 10-foot dune view deck would be constructed.
- Eight benches along the railroad berm trail would be installed.
- A coordinated signing program would be designed and implemented to include kiosks and the following sign types: entry, information, and safety, boundary, regulatory, trail marker and direction, interpretive, and temporary.

Access Management:

A full time onsite caretaker position and protocols regarding vehicle control, law enforcement, and security would be established.

The following cooperative agreements would be established:

- Agreement between BLM and USFWS for the management of the Ma-le’l Dunes CMA;
- Agreement between BLM, USFWS, and the Redwood Gun Club;
- Agreement between BLM, USFWS, and the Wiyot Tribe;
- Agreement between USFWS and Sierra Pacific; and
- Agreement between BLM, USFWS, and Friends of the Dunes.

This biological assessment addresses those elements of the proposed action that may result in direct or indirect impacts to habitats known to support, or with potential to support (e.g. as a result of on-going

habitat restoration) federally listed species. This applies to the beach and nearshore dune environments within the CMA. It includes an assessment of the continued public use of recently improved areas within the southern portion of the CMA only as these activities relate to a change from the existing condition and public uses.

Specific proposed actions identified within the access plan that may affect listed species and/or designated critical habitat include the following:

1. Establishment of 7,000 linear feet of new trail within the nearshore dunes, 354 linear feet of which pass through or immediately adjacent (within 50 feet) to endangered plant areas and the related impacts from public access;
2. Installation of boundary and directional trail signs within the nearshore dune environment. These signs will be placed at appropriate sight distances for clear trail and property boundary demarcation;
3. Decommissioning of casual trails within the nearshore dune environment. This may include native plant revegetation and/or erecting natural barriers or signs;
4. Construction of a footbridge over seasonal wetland within the nearshore dunes. This bridge will be installed in the foredunes across a seasonal wetland located on the Hudt Trail route within Ma-le'l North. It is described in the access plan as a puncheon-style footbridge spanning approximately 15 feet long and 4 feet wide, with anchors to prevent theft.

Of particular significance, proposed improvements and recommended public uses outlined in the access plan are expected to lead to an increase in visitor use to the beach and nearshore dunes. The USFWS estimated the public use of the Mad River Slough Cooperative Management Area between 1992 and 1994, prior to acquisition of the Ma-le'l Dunes addition, at approximately 2,000 visitors per year (USFWS 2004). Use figures from the adjacent BLM property were estimated as high as 6,000 per year during that same period (USFWS 2004). Visitors to Ma-le'l South and Ma-le'l North are expected to total approximately 16,500 and 8,000 persons per year, respectively, upon implementation of the access plan (HWR 2006). This represents an estimated 64% increase in visitor use to Ma-le'l South, and an estimated 75% increase in visitor use to Ma-le'l North upon implementation of the proposed action.

Minimization Measures:

Endangered Plants

A primary component of the Ma-le'l Dunes CMA Public Access Plan is to establish a designated hiking trail system to provide pedestrian access to the beach and nearshore dunes. Ma-le'l South has an existing equestrian and hiking trail system currently in use, however, beach access is not well defined or adequately signed at Ma-le'l North, and a number of causal trails have become established throughout the CMA. The access plan provides for the consolidation and/or decommission of various casual trails currently in use to avoid or minimize impacts to sensitive biological and cultural resources, as well as the extension of existing trails to provide further opportunities for beach and dune access.

Those portions of the proposed trail system that pass through sensitive dune environs were selected to avoid, to the extent practicable, endangered plant areas and/or cultural resource sites. The proposed route was selected in consultation with Friends of the Dunes representative Carol Vandermeer, U.S. Fish and Wildlife Service's Natural Resource Specialist Patti Clifford, and Wiyot Cultural Resource Advisor Marne Atkins, and based on the most recent distribution data for endangered plant populations provided by USFWS and BLM (pers. comm. Laura Kadlecik HWR Engineering & Science). Proposed new trail sections generally follow existing casual trails in all but a few locations,

and there are no new trail sections proposed through any existing rare plant areas. While the new alignment does not avoid endangered plant areas entirely (in some areas the trail passes within a few feet of known occurrences of rare plants), it is considered the least environmentally damaging alternative.

The access plan recommends the use of a variety of signs to welcome visitors to the CMA and to provide direction and guidance regarding land use regulations, interpretive information and boundary demarcation (HWR 2006). The use of regulatory signs will serve to inform visitors of regulations pertaining to biological resource protection, and directional trail signs will serve to clearly delineate hiking trails and discourage visitors from entering endangered plant areas. Boundary signs will be used to inform visitors where there is a change in ownership, jurisdiction, and/or management. Directional trail signs and boundary signs are especially important in the open dunes to distinguish the trail corridor and to discourage entry onto adjacent properties such as the Lanphere Dunes Unit of HBNWR. Directional trail signs and boundary signs will be installed at appropriate sight distances for clear trail/property boundary demarcation.

In this regard, the use of signs is expected to partially mitigate for the expected increase in visitor use to the CMA by consolidating foot traffic and minimizing the potential for trampling of endangered plant species. The development of the signing program will be consistent with the Humboldt Bay Interpretive Signing Manual (2003) developed by the Natural Resources Division of the Redwood Community Action Agency (HWR 2006).

The installation of directional signs or boundary signs within or adjacent to endangered plant areas will require a pre-construction survey to insure that activities associated with the placement of the signs (i.e. digging, material lay down, etc.) do not disturb or remove any endangered plant species. All work related to trail development within an endangered plant area shall be overseen by a USFWS or BLM CMA resource manager. All construction activities occurring within the nearshore dune community (initial placement of signs, construction of bridge over seasonal wetland) shall be timed to avoid the beach layia-growing season. All occurrences of Humboldt Bay wallflower located adjacent to construction areas shall be flagged in the field prior to commencement of work, and the resource manager will document any adversely affected individuals.

In addition to the minimization measures listed above, the USFWS will implement a conservation measure for Humboldt Bay wallflower that involves the collection of seed from reproductive individuals found within the Lanphere Dunes Unit and their subsequent dispersal within newly restored habitats on the Fernstrom-Root Parcel at Ma-le'l North. The USFWS proposes to collect and distribute seed over a period of two seasons, and monitor for the successful introduction of the wallflower to the Fernstrom-Root parcel on year three (pers. comm. Andrea Pickart USFWS). Success shall be determined by estimating the number of flowering individuals on the Fernstrom-Root property by the third season. This measure is intended to facilitate the expansion of the wallflower population to newly restored areas within the CMA, and to help offset potential adverse impacts from ground disturbance associated with the anticipated increase in public access to the nearshore dunes.

In summary, the following measures shall be implemented in conjunction with the Ma-le'l Dunes CMA Access Plan to minimize potential adverse effects to endangered plant populations:

1. Trail routes through the dune environs shall represent the least environmentally damaging alternative, as identified by the CMA agency resource managers and staff and based on the most recent distribution data for beach layia and Humboldt Bay wallflower;
2. New trail routes will be sited in existing casual trails to the greatest extent possible to limit ground disturbance. All other casual trails will be decommissioned to minimize the effects of trampling to native vegetation;

3. Regulatory, directional and boundary signs will be utilized to inform visitors of regulations pertaining to biological resource protection, clearly delineate hiking trails and discourage entry into adjacent properties, particularly along the northern boundary between the Ma-le'l and Lanphere Units;
4. The boundary between the Ma-le'l Dunes Unit and the Lanphere Dunes Unit of HBNWR will be signed at intervals of no more than 300 feet from the beach to the forest edge to indicate a USFWS management change, and as necessary based on site and trail configuration to discourage off trail use in the vicinity of sensitive resources. "No dogs beyond this point" signs will be posted adjacent to the USFWS boundary signs, including the boundary USFWS shares with the BLM that is within the CMA project area;
5. All work related to trail development within an endangered plant area shall be overseen by a CMA agency resource manager or staff;
6. Construction activities conducted within the nearshore dune community (i.e. initial placement of signs, construction of bridge over seasonal wetland) shall be timed to avoid the beach layia growing season;
7. All occurrences of Humboldt Bay wallflower located adjacent to construction areas shall be flagged in the field prior to commencement of work, and the overseeing agency resource manager will document any adversely affected individuals.
8. USFWS will implement a conservation measure for Humboldt Bay wallflower that involves the collection of wallflower seed and subsequent dispersal in newly restored habitats on the Fernstrom-Root parcel at Ma-le'l North.

Existing management activities currently conducted by the BLM and USFWS are expected to continue in perpetuity for the protection of endangered plant populations. As implemented, these measures will further serve to monitor potential impacts to endangered plant populations resulting from an increase in visitor use of the CMA. These include:

1. Monitoring for new invasions of exotic species, especially in the vicinity of the equestrian trail resulting from horse feces, and their subsequent eradication;
2. Rare plant population monitoring as identified in existing management plans, including monitoring within the Lanphere Dunes Unit to identify potential indirect offsite impacts from unauthorized pedestrian access;
3. On-going restoration activities, which are expected to increase suitable habitat for endangered species.

USFWS is currently in the process of implementing a restoration plan at Ma-le'l North designed to restore the natural function (biotic and abiotic processes) of the dune system by removing invasive, nonnative vegetation and to achieve a "virtually self-maintaining system" (EDAW 2004). Since 1994, the BLM has worked with the California Conservation Corps (CCC) to remove upward of 20-acres of European beachgrass at Ma-le'l South, although much work is still needed for the treatment of resprouts (USDI-BLM 2004b, HWR 2006).

Conservation Recommendations

Western Snowy Plover

When native vegetation throughout the CMA was in an earlier successional stage and the foredune was poorly developed, the beach and backdunes of the CMA possibly supported suitable breeding habitat for the western snowy plover. Breeding season surveys have been conducted within portions of the CMA since 1997, and have not resulted in the documentation of breeding plovers there. However,

the surveys are not considered adequate to determine probable presence or absence of the western snowy plover because they have been inconsistent and have not included a survey of the backdunes. Because of a lack of recent intensive breeding season surveys for the species throughout the foredunes and backdunes of the CMA a monitoring scheme will be implemented as part of the Ma-le'l Public Access Plan. Monitoring will include a minimum of 1 breeding season (March 1 September 15) survey per month in suitable habitat and will be implemented as funding and personnel resources are available, so that plover use during the breeding season may be detected. Should plovers be detected within the CMA during the breeding season, the BLM and HBNWR will immediately coordinate with the USFWS to determine appropriate protection measures, which would utilize the most current methodologies for plover protection. BLM and HBNWR will re-initiate consultation if ongoing activities may affect the species.

California Brown Pelican

The action area falls outside of the breeding range for California brown pelican. In addition, no suitable breeding habitat for brown pelican occurs within the action area. Brown pelican may incidentally use the wetted intertidal zone within the CMA while foraging the nearshore area; however, most pelican use is at river mouths within the Eel River, Humboldt Bay, and Mad River areas. Therefore, no adverse impacts to the species are expected and no conservation recommendations for the species.

Action Area

The action area is defined as the Ma-le'l Dunes CMA and includes both BLM and USFWS property that will be cooperatively developed and managed to accommodate public access. It encompasses 444 acres of public land along a 1.5-mile stretch of coastline on the Samoa Peninsula (North Spit) of Humboldt Bay between the City of Arcata and the unincorporated community of Manila in Humboldt County, California (Figure 1). Access to the action area is via Ma-le'l Road from Young Lane off Samoa Boulevard/State Highway 255.

The site is bordered to the west by the Pacific Ocean, to the north by the Lanphere Dunes Unit of the HBNWR, to the east by Humboldt Bay and the Mad River Slough, and to the south by the BLM Manila Dunes Area of Critical Environmental Concern (ACEC). A public shooting range (the Redwood Gun Club (RGC)), an active lumber mill (Sierra Pacific Industries (SPI)) and several residential properties also abut the CMA (Figure 2).

The BLM owns and manages the southern 154 acres and the USFWS owns and manages the northern 290 acres of the 444-acre CMA, known as Ma-le'l South and Ma-le'l North, respectively. Ma-le'l South includes 112 acres of the Manila Dunes ACEC and a 42-acre property formerly leased by the Humboldt Buggy and ATV Association (a.k.a. "The Buggy Club") and known as the Khoaghali parcel. Ma-le'l North includes the recently created Ma-le'l Dunes Unit of the HBNWR Complex and is comprised of the Fernstrom-Root property (formerly part of the Lanphere Dunes Unit of HBNWR) and a 160-acre property formerly owned by the Buggy Club and historically called "the buggy club parcel" (HWR 2006).

Endangered Plants

The Ma-le'l Dunes CMA features a unique assemblage of coastal dune, forest, and wetland communities that comprise a portion of the dune-slough ecosystem of the upper Samoa Peninsula, or North Spit. The North Spit is a relatively mature dune system that contains a diversity of landforms.

Typically, the dune system begins above the beach with the foredune, a ridge of sand that forms parallel with the beach above the mean high tide. Behind the foredune is a series of longitudinal ridges and swales oriented parallel to the prevailing winds. Collectively, the foredune, ridges, and swales are referred to as the nearshore dunes. East of the nearshore dunes is a deflation plain that grades into large parabolic moving dunes or sand sheets. Older dunes, located east of the moving dunes, consist of stabilized parabolas, ridges and depressions that support coniferous coastal forest on the uplands and deciduous forest or marshes in the low lying wetlands. Estuarine wetlands associated with the Mad River Slough occupy the far eastern side of the CMA.

The discussion of the existing environment is restricted to habitats within the CMA that support or have potential to support, federally listed species. This includes the nearshore dunes and open sand areas west of the coniferous forest. Four main vegetation types have been identified within the nearshore dunes of the Ma-le'l Dunes CMA: dune mat, dune swale, European beachgrass, and lupine-coyote brush scrub (Figure 3).

Dune Mat

Approximately 75 acres of dune mat is found within the Ma-le'l Dunes CMA. Dune mat is characterized by native, perennial forbs, grasses, and low-growing shrubs growing on semi-stabilized nearshore dunes. Overall, plant species diversity is high in this vegetation type but cover is generally low, and open sand is a significant component of the community. In the Humboldt Bay dunes, dune mat is represented by the Sand verbena - beach bursage series described by Sawyer and Keeler-Wolf (1995) and Pickart & Sawyer (1998). Common species of this association include beach bursage (*Ambrosia chamissonis*), yellow sand-verbena (*Abronia latifolia*), beach pea (*Lathyrus littoralis*), dune goldenrod (*Solidago spathulata* ssp. *spathulata*), beach strawberry (*Fragaria chiloensis*), seaside daisy (*Erigeron glaucus*), beach morning glory (*Calystegia soldanella*), dune buckwheat (*Eriogonum latifolium*), dune sagebrush (*Artemisia pycnocephala*), seashore bluegrass (*Poa douglasii*), and beach evening primrose (*Camissonia cheiranthifolia*) (Pickart & Sawyer 1998).

Dune mat provides habitat for two federally listed endangered plant species that occur within the CMA, Humboldt Bay wallflower and beach layia, as well as a number of other special-status plants recognized by the State of California. This habitat has been severely impacted by the spread of invasive exotic species, primarily European beachgrass (*Ammophila arenaria*), yellow bush lupine (*Lupinus arboreus*), and iceplant (*Carpobrotus edulis* x *C. chilensis*), and reportedly has been reduced to an estimated 17% (470 acres) of its original, potential extent in the Humboldt Bay dunes (The Nature Conservancy, unpublished data *in* Pickart & Sawyer 1998).

Dune Swale

Dune swales occupy approximately 50 acres of the Ma-le'l Dunes CMA. Also known as dune hollows, dune swales are seasonal, freshwater wetlands that form in the nearshore dunes. During the spring and summer months, strong prevailing winds erode the sand down to the summer water table. When the water table rises in the winter, ephemeral ponds are formed and colonized by hydrophytic vegetation.

There are two vegetation types associated with dune swales: herbaceous and woody. Herbaceous swales are typically dominated by Brewer's rush (*Juncus breweri*) and/or slough sedge (*Carex obnupta*), the later being associated with areas that exhibit greater wetland hydrology. Over a period of just a few years, herbaceous swales can succeed to woody swales. Hooker willow (*Salix hookeriana*) is usually the first to colonize herbaceous hollows, sometimes followed by beach pine

(*Pinus contorta* var. *contorta*), wax myrtle (*Myrica californica*), red alder (*Alnus rubra*), and occasionally Sitka spruce (*Picea sitchensis*). Woody swales often have an understory dominated by Brewer's rush and/or slough sedge, and associated species in both vegetation types include Pacific silverweed (*Potentilla anserina* ssp. *pacifica*), springbank clover (*Trifolium wormskioldii*), and California blackberry (*Rubus ursinus*).

The Natural Heritage Program of the California Department of Fish and Game does not distinguish dune swales from other freshwater marshes and swamps, however for management purposes they are mapped separately from other wetlands located within the CMA because of their distinctive flora and geomorphology. Vegetated dune swales such as those described from the Ma-le'l Dunes CMA are considered Waters of the U.S. and are regulated by the United States Army Corps of Engineers under section 404 of the Federal Clean Water Act. They also fall within the jurisdiction of the California Coastal Commission as Coastal Act wetlands. Dune swales can provide important habitat for a variety of wildlife species, including songbirds, raptors, small mammals (including bats), amphibians and reptiles.

European Beachgrass

Approximately 25 acres of European beachgrass occur at the Ma-le'l Dune CMA. Native to coastal dunes in Europe, European beachgrass is a prolific, rhizomatous grass that was introduced to the North Spit of Humboldt Bay in the early 1900's, where it was planted to stabilize moving sand (Pickart & Sawyer 1998). In northern California and Oregon, it is known to substantially alter the physical and biological conditions of the natural dune environment, consequently leading to a loss of native vegetation (Pickart & Sawyer 1998).

In the Humboldt Bay dunes, European beachgrass has displaced much of the native dunegrass (*Leymus mollis*) and dune mat vegetation. Few species are found in association with the European beachgrass series, but relict native species can occur in and on the periphery of this vegetation type. Foredunes dominated by European beachgrass tend to form steep, continuous ridges oriented parallel to the beach. These stabilized foredunes experience few "blowouts," reducing sand movement to the interior dunes.

Restoration efforts of native dune vegetation often involve the eradication of European beachgrass and other invasive exotics such as yellow bush lupine and iceplant. Efforts to eradicate non-native species from the nearshore dunes and forest have been underway for several years on the BLM Manila Dunes and since 1992 on the USFWS Fernstrom-Root parcel, and have been successful. The agencies have begun to focus restoration efforts on their new respective acquisitions, the Khoaghali and Buggy Club parcels. The majority of the existing European beachgrass within the Ma-le'l Dunes CMA is found within the newly acquired, former "Buggy Club" parcel at Ma-le'l North, where restoration efforts are currently underway.

Lupine–Coyote Brush Scrub

The lupine-coyote brush scrub vegetation type occupies approximately 10 acres within the CMA, and is primarily found in the nearshore dunes of the newly acquired "Buggy Club" parcels at Ma-le'l North and Ma-le'l South. It is characterized by the presence of two shrub species, yellow bush lupine (*Lupinus arboreus*) and coyote brush (*Baccharis pilularis*), which occur in varying degrees of dominance and cover. Wax myrtle and twinberry (*Lonicera involucrata*) may also be associated with this vegetation type, although these shrubs occur in lower cover values. The shrub canopy may be intermittent or continuous, but is typically less than 2 m (6.6 ft) in height (Pickart & Sawyer 1998).

The ground layer is variable, but European beachgrass and exotic annual grasses such as ripgut brome (*Bromus diandrus*), European hairgrass (*Aira caryophylla* and *A. praecox*), and vulpia (*Vulpia bromoides*) are common in the understory.

Yellow bush lupine is believed to be native between Sonoma and Ventura counties but has become naturalized locally. It is considered an invasive exotic species in Humboldt County where, like European beachgrass, it has a history of being planted to stabilize coastal dunes (Sawyer and Keeler-Wolf 1995). Yellow bush lupine acts as a catalyst for the invasion of other non-native species by increasing the levels of organic matter and releasing nitrogen to the surrounding substrate, thereby diminishing the competitive advantage native species' have on the otherwise low-nutrient sand dunes (Pickart & Sawyer 1998). Although coyote brush is a native species, it is typically found on degraded dunes that have previously been stabilized by European beachgrass and/or yellow bush lupine.

Open Sand Areas

Open sand is the mapping unit used to delineate the beach and the moving dunes within the CMA that are primarily unvegetated. Also referred to as the littoral strip, the upper beach represents the area of loosely compacted sand that occurs between the tidal wash zone and the foredune. Abiotic factors, rather than stabilizing vegetation, influence the landscape here. High winds, waves, cyclic tidal inundation and sand transport by littoral action severely restrict plant growth. Drift accumulates here and new dunes form if the beach is accreting (i.e. expanding). Pioneer plant species such as the exotic but non-invasive sea rocket (*Cakile maritima* and *C. edentula*) and native dunegrass (*Leymus mollis*) may establish in the summer and fall, but are frequently removed by winter storm activity. European beachgrass may also colonize open sand areas, leading to the creation of very high, stable foredunes.

Moving dunes to the east also support little to no vegetation; however, sea rocket, yellow sand verbena, and the invasive European beachgrass are known to occur. These active, unstable, and windblown dunes do not provide optimal habitat conditions for endangered plants or associated dune mat species. However, the federally endangered beach layia is occasionally found growing here, although in relatively low density.

Species Accounts and Status within the Action Area

Humboldt Bay Wallflower

Federal Status: Endangered (1992)

The Humboldt Bay wallflower (*Erysimum menziesii* ssp. *eurekense*) was listed as endangered under the Federal ESA in March of 1992, and is included in the 1998 Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly (USFWS 1998). It is one of four subspecies of Menzies' wallflower (*Erysimum menziesii*), three of which are federally recognized as endangered with a collective distribution over three coastal dune systems in Humboldt, Mendocino, and Monterey counties. Humboldt Bay wallflower is a local endemic, restricted to the nearshore dunes around Humboldt Bay. The majority of the population occurs on the Samoa Peninsula (North Spit), although isolated subpopulations have also been documented on the South Spit and Elk River Spit of Humboldt Bay (Pickart & Sawyer 1998).

Humboldt Bay wallflower primarily grows on the flanks and crests of nearshore dunes in the dune mat community, usually in clustered patches ranging from a few to hundreds of individuals. The wallflower is also known to occur in suboptimal habitats such as open sandy areas and on the borders of lupine scrub and herbaceous swales. It is not usually found growing in dense vegetation where invasive species are dominant.

Humboldt Bay wallflower is a member of the mustard family (Brassicaceae). Its life history is that of a semelparous (monocarpic) perennial, meaning that it flowers and produces fruit only once during its life, after which, it dies. The wallflower forms a basal rosette of leaves that may persist for up to eight years before flowering. Blooming typically occurs from March through April, although it may begin as early as late February. The fruits mature by mid-June. The seeds remain attached to the fruit walls after dehiscence, and disperse over a long period, primarily in conjunction with winter storm events that dislodge the mature inflorescences and scatter them by way of a tumbling action (Pickart and Sawyer 1998). Fecundity is high, with individual plants producing numerous seed; however, the wallflower does not have a persistent seed bank (Carothers 1996) and seedling survivorship is low, with 98.3% mortality shown to occur in the first year (Pickart and Sawyer 1998). Reproduction may also be hindered by infestation of *Albugo canadensis*, an endemic fungal pathogen that causes crucifer white rust disease in the local subspecies. Disease symptoms are more prevalent on reproductive individuals, where they can decrease fecundity by reducing seed number or viability (Pickart & Sawyer 1998).

A primary threat to Humboldt Bay wallflower at the Ma-le'l Dunes CMA is displacement from invasive non-native species, particularly European beachgrass, yellow bush lupine, ice plant, and jubata grass (*Cortaderia jubata*). Management strategies for the recovery of the wallflower have focused primarily on control and eradication of these species. Other conceivable threats to the wallflower within the Ma-le'l Dunes CMA include actions that cause habitat degradation and destruction or mortality of individual plants, such as facility development, vehicle trespass, episodic and high intensity use by pedestrians or horses, and wildlife predation and disease (USDI-BLM 2004b).

Population and Distribution

The Recovery Plan written in 1998 described six extant occurrences of Humboldt Bay wallflower, with an estimated population size of 18,800 individuals occupying approximately 2,235.7 acres. The South Spit colony occurring on private land owned by Texaco was reported to have 178 plants in 1991 and only 75 plants in 1998 (USFWS 1998).

More recent survey efforts place the population size higher than estimates reported in the Recovery Plan. In 1989, Andre and Sawyer sampled wallflowers larger than 3 cm (1.2 in) in diameter on the North Spit, and estimated the population at 20,657 plants ± 2,344 (95% confidence intervals) (Pickart & Sawyer 1998). Nine years later (1998), the Nature Conservancy re-sampled the North Spit population using the same methods and found that the population had increased to 29,657 (±5,263), but noted that the increase was not consistent among all North Spit colonies, some of which had declined (Pickart & Sawyer 1998). The North Spit has had a considerable amount of restoration work and invasive plant removal since 1988, which is thought to be correlated to the increase in wallflowers.

Also in 1998, a previously undocumented colony of wallflower was discovered on the Elk River Spit, a census conducted in 2000 revealed a population total of 3,782 plants over 2 cm in diameter, of which 13% were reproductive; and a total of 6,066 plants < 2 cm in diameter (USFWS unpublished data). In 2002, the USFWS re-surveyed the South Spit colony and found a total of 133 individuals (excluding small rosettes less than 2 cm in diameter), of which 32 percent were reproductive. By 2006, the South Spit colony had increased to 457 plants (excluding small rosettes) of which 33 percent were reproductive (Clifford 2006). This increase is attributed to the caging of flowering individuals, which were being grazed by deer.

Population and Distribution within Action Area

In 2006, the USFWS completed a third population-wide survey for Humboldt Bay wallflower; however, population size data will not be available before completion of the Ma-le'l Dunes Coastal Access Plan Biological Assessment. The current (2006) distribution of the wallflower was provided and mapped for the CMA as shown in Figure 4. Preliminary observations indicate that the population has increased in range and probably in size (Andrea Pickart, pers. comm.).

Between 2003 and 2005, the Center for Natural Lands Management (CNLM) served as a liaison for the acquisition and transfer of the Fernstrom-Root parcel and the two former Khoaghali and Buggy Club parcels from private ownership to the USFWS and the BLM. In 2004, CNLM surveyed and mapped the population of Humboldt Bay wallflower within what is now referred to as Ma-le'l North. CNLM estimated the population within two macroplots (representing close to the total population) at 1,040 wallflowers with a 95% confidence interval of ± 297 individuals (USFWS unpublished data *in* EDAW 2005).

The BLM reports that in 1997 the 112-acre Manila Dunes ACEC had approximately 500 individuals of wallflower with a standard error of about 55 (USDI-BLM 2004b). Most of the wallflower was found in the north half of the property, and no wallflower has been seen within BLM's newly acquired, 42-acre parcel Khoaghali parcel as of 2006.

Based on the 1997 population-wide survey, the wallflower at the Ma-le'l Dunes CMA (using the most recently available sampling data from CNLM, BLM, and USFWS) represents approximately 5.1% of the entire population of Humboldt Bay wallflower, and 5.2% of the North Spit population.

Beach Layia

Federal Status: Endangered (1992)

Beach layia (*Layia carnosa*) was listed as endangered under the federal ESA in March of 1992, and is included in the *1998 Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly* (USFWS 1998). This species is found in coastal dune systems from Vandenberg Air Force Base in Santa Barbara County north to Freshwater Lagoon in Humboldt County (CNDDB 2006). It occurs in greatest abundance in Humboldt County, and in particular, on the North Spit of Humboldt Bay (USFWS 1998).

In the Humboldt Bay dunes, beach layia is found primarily on nearshore dunes in the dune mat community. It occurs in lower densities along margins of lupine scrub, herbaceous hollows, and open areas with moving sand. It is also known to tolerate disturbed and gravelly soils along roadsides, vehicle trails, and footpaths (Duebendorfer 1992). Beach layia readily colonizes newly created bare sand areas, and is resilient to disturbance; however, it does not tolerate competition with other plants and does not establish in areas where there is high cover of native or non-native plants.

Beach layia is an annual herb that belongs to the sunflower family (Asteraceae). It germinates in mid-winter during the rainy season and typically blooms from March to May, completing its life cycle by late spring. Seeds are dispersed mostly by wind in late spring and summer. The number of seed-heads produced by individual plants varies in relation to plant size. Short, unbranched, erect plants growing on dry, exposed sites may produce only a single head, whereas taller, highly branched individuals found in moist dune swales may produce as many as 100 seed heads (USFWS 1998).

Loss of habitat due to coastal development, encroachment of non-native plant species, and trampling by vehicles and pedestrians are all factors that contribute to the decline in numbers of this species. Beach layia is most susceptible to trampling effects during its growing season from mid-winter to late

spring. However, a certain amount of disturbance during the off-season may favor beach layia by opening up areas for colonization (Botanica Northwest Associates 1992).

Population and Distribution

Beach layia is currently known from approximately 20 occurrences over eight dune systems (representing approximately 1,390 acres) between Humboldt County and Santa Barbara County. The largest population reportedly occurs on the North Spit of Humboldt Bay. Five historical occurrences in San Francisco, Monterey, and Humboldt counties are believed to have been extirpated (USFWS 1998). The population distribution of beach layia does not lend itself well to the CNDDB definition of "occurrences." There is a disjunct occurrence at Freshwater Lagoon (Redwood National Park; less than one acre). Beach layia then occurs in a patchy fashion along a semi-continuous corridor from Mad River Park south to the Samoa Dunes Recreation Area, on a combination of private, NGO, local, state, and federal government properties. Populations continue along the South Spit (BLM managed), Eel River Wildlife Area (Department of Fish and Game), and the vicinity of McNutt Gulch and the mouth of the Mattole River (private and BLM).

The following distributional information for Marin, San Francisco, Monterey, and Santa Barbara counties is taken from the Recovery Plan, dating from the 1990s (no updated information is available (USFWS 1998): The Marin County occurrences are located in the dunes between Kehoe Beach Dunes and Point Reyes lighthouse at Point Reyes National Seashore. Surveys by California Native Plant Society (CNPS) volunteers have recorded thirteen colonies along the dune complex at Point Reyes. An occurrence in Golden Gate Park on the San Francisco Peninsula has been extirpated since 1904. The Monterey Peninsula dune system had four occurrences, although the Point Pinos site is thought to have been extirpated. After it had been reported as extirpated, an occurrence at Asilomar State Beach was rediscovered following the removal of iceplant. Additional occurrences have been discovered on neighboring private property. Two beach layia occurrences exist on north Spyglass Hill and on the nearby Spyglass Hill dunes. In April 1995, David Keil rediscovered a small occurrence (80 plants) of beach layia on Vandenberg Air Force Base, Santa Barbara County. During a subsequent visit to the site an additional 200 individuals were discovered closer to the ocean bluffs.

The total range wide population size of beach layia is estimated in the Recovery Plan at 300,000 individuals. This estimate was acquired mostly from informal estimates of populations made across the range prior to 1998, and it did not include an estimated 19,400 plants documented in 1993 from the Eel River Wildlife Area, or the population at the Lanphere Dunes Unit that had been estimated at +/- one million. The historical data is considered of limited value due to large annual fluctuations in both population size and local distribution, and the frequent underestimation of population size in small annual species such as beach layia.

A 1992 pilot study of field sampling methods conducted by Botanica Northwest found an estimated 2.5 million individuals ± 750,000 on the North Spit (Botanica Northwest Associates 1992). The 2005 sample of beach layia at the Lanphere Dunes Unit estimated at total of 1.5 million plants +/- 320,000 (USFWS unpublished data). A statistical protocol was also implemented by the BLM and USFWS in May 2003 to estimate the beach layia population on the South Spit of Humboldt Bay. That data has not yet been fully analyzed, but preliminary analysis suggests the total South Spit population may exceed 5 million plants (unpublished data on file, BLM Arcata), further suggesting that the summary of occurrence data in the Recovery Plan may grossly underestimate the true range wide population of beach layia. Redwood National Park personnel estimated the beach layia population at Freshwater Spit in 2003 at just over 11,000 plants (Redwood National Park 2003 in USFWS) Based on these estimates, the total number of beach layia occurring around Humboldt Bay and Redwood National

Park likely exceeds 5 to 6 million. Population estimates for sites located south of Humboldt County are not available.

Population and Distribution within Action Area

Beach layia was surveyed and mapped by CNLM in May 2004 at Ma-le'l North, where it was found to occupy approximately 6.4-acres (Figure 4). Density was estimated at 3.8 individuals/m^2 ± 1.3 (95% confidence interval) by sampling a single, 0.6-acre macroplot (USFWS unpublished data *in* EDAW 2004). The BLM reports that beach layia is abundant throughout the foredunes of Ma-le'l South, and is increasing where invasive weed eradication efforts have occurred. Completion of invasive weed eradication over the nearshore dunes of the newly acquired, 42-acre former Khoaghali parcel is expected to boost beach layia density and distribution on about 10 acres (USDI-BLM 2004b). Ongoing restoration at Ma-le'l North is also expected to result in increased population of beach layia at that site.

Western Snowy Plover

Federal Status: Threatened (1993)

In 1993, the USFWS listed the coastal population of the western snowy plover (*Charadrius alexandrinus nivosus*) as a threatened population under the federal ESA (USFWS 1993) and designated critical plover habitat in September 2005 (USFWS 2005). The plover was listed based on evidence of a significant population decline, as well as a reduction in the number of breeding locations. Just prior to the time of listing, estimates (Page et al. 1991) placed the California population at 1,386 plovers, down 11 percent from the 1,565 plovers estimated a decade earlier (Page and Stenzel 1981). In 2000, a statewide breeding survey indicated a further decline of ~30% to 976 plovers in California (Page, unpublished data).

Two petitions to remove the coastal population of the western snowy plover from the Federal List of Threatened and Endangered Species, the first filed in September 2002 by the Surf Ocean Beach Commission of Lompoc, California and the second filed in May 2003 by the City of Morro Bay were submitted to the USFWS. These petitions contend that the coastal population does not qualify as a distinct population unit and therefore, is not threatened. The USFWS initiated status reviews on 22 March 2004 upon finding that the petitions presented substantial information to warrant consideration of delisting (69 FR 13326). The 12-month finding on the delisting petitions was completed April 12, 2006, reconfirming the Pacific coast western snowy plover's status as threatened (71 FR 20607).

The causes of the western snowy plover's population decline were determined to be a combination of the following: 1) increased human recreational use of beach habitats (including off-highway vehicle (OHV) traffic); 2) alteration of nesting habitat from encroachment by European beach grass (*Ammophila arenaria*); and 3) predation of eggs and young by corvids (*Corvus brachyrhynchos*, *C. corax*), gulls (*Larus* spp.), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). These three factors either reduce reproductive and survival rates or cause plovers to avoid otherwise suitable habitat. Currently, plovers breed in coastal habitats (salt pans and levees, dredge spoil islands, river gravel bars, and unvegetated ocean beaches) at 28 locations from the central Washington coast to Baja, Mexico (USFWS 1993).

As part of the recovery plan, the USFWS designated Mendocino, Humboldt, and Del Norte counties as a discrete management unit (Recovery Unit 2), one of six management units within the range of the listed population. Within Unit 2, snowy plovers breed and over-winter along ocean beaches and along the lower Eel River gravel bars. The majority of plovers breeding in Recovery Unit 2 occur in Humboldt County.

Historical records and recent surveys (Page and Stenzel 1981, Fisher 1992-94, LeValley 1999, Page unpublished data) indicate the importance of Humboldt County to breeding plovers. In 1977, Page and Stenzel (1981) found 64 birds (18 nests) at seven locations in the county and estimated that this represented 6% of coastal plovers breeding in California, and that Humboldt County had more plovers than any other location north of Monterey. During the breeding seasons of 1992-1994, Fisher conducted surveys of beach habitats and estimated 22-32 plovers initiated 17-26 nests. More recently, LeValley (1999) estimated that 49 birds (23 nests) bred at four locations in 1999; Interestingly, LeValley noted that plovers were absent from at least five beach sites where they were reported nesting by Page and Stenzel (1981) or Fisher (1992-1994). In 2000, this same area supported about 40 adults and 42 nests (McAllister et al. 2001). Over the past 6 years (2001-2006), increased research efforts provided estimates of 57-74 breeding plovers annually in Recovery Unit 2, nearly all of which were in Humboldt County (Colwell et al. 2006).

Historically, snowy plovers nested along much of the once open beaches of Humboldt County, including the north spit of Humboldt Bay, possibly within the area that now comprises the Ma-le'l Dunes CMA. Harris (1996) noted that two sets of eggs were collected from the ocean beach near Samoa on April 27,1902 (M. and J. Davis *in* Harris 1996). However, following the introduction of European beachgrass to the west coast in the late 1800's and its subsequent encroachment onto Humboldt County beaches, local snowy plover use patterns have changed. The European beachgrass invasion has lead to the stabilization of many of Humboldt's dune systems and the loss of open sand available for habitat. This has drastically changed the suitability of much of the County's coastline for the snowy plover, as the species requires open sand for breeding. Within the CMA, the ocean regularly reaches the base of the foredune at high tide, even during the breeding season, both in areas that were altered by European beachgrass and in those that have never been invaded.

Inter-agency breeding season (March-September) surveys conducted approximately once per month since 1997 on the north spit of Humboldt Bay, including the beaches (but not the back dunes) within the CMA, have not detected snowy plovers. Annual winter surveys of the same areas have also failed to record plovers. However, Ron LeValley reported the observation of a non-breeding individual in the vicinity in 1996, south of the Mad River Slough and Dunes CMA on the adjacent BLM property (LeValley, pers. comm.). More recently, five snowy plovers were observed on 17 December 2005 during the Arcata Christmas Bird Count. These birds were recorded on the north spit just west of the Fairhaven Electric building, approximately 6 miles south of the Ma-le'l Dunes CMA (Kerry Ross, pers. comm.). Currently the closest known breeding locations for plovers in relation to the CMA are at Mad River Beach, approximately 4.5 miles north of the action area and at the south spit of Humboldt Bay, approximately 8 miles south of the action area (Colwell et al. 2006).

Although the beach at the Ma-le'l Dunes CMA appears too narrow to support breeding western snowy plover, the back dunes do represent suitable breeding habitat. Plovers are known to nest in back dune areas from a number of coastal locations in Oregon and southern California, including beaches backed by steep dunes such as at Oceano Dunes State Vehicular Restoration Area. Locally, plovers are known to nest in back dunes at Clam Beach.

California Brown Pelican

Federal Status: Endangered (1970)

The brown pelican is a large waterbird of temperate and subtropical North American marine and estuarine waters. Truly inland occurrences in California (away from the vicinity of the Salton Sea) are unusual, particularly so in the northern portion of the state.

The species breeds along the Atlantic Coast from Chesapeake Bay (recently) south through the Gulf of Mexico and into coastal South America and on the Pacific Coast from southern California southward along the west Mexican coast into South America (Galapagos Islands). Along temperate North American coasts, birds annually move northward following the breeding season. Along the West coast, large numbers occur from mid-summer through fall northward to southwestern Washington and sparingly to Puget Sound and southwestern British Columbia.

Brown pelicans reach the northern limit of their breeding range on the Pacific Coast along the southern half of the California coast. Historically, breeding populations of these birds in southern California have fluctuated in response to environmental conditions. Current thought suggests that these populations increase during periods of ocean warming (Baldridge 1973, Anderson and Anderson 1976). The brown pelican breeds regularly in California only on West Anacapa Island and has nested only rarely elsewhere in the Channel Islands, specifically on Prince Island, Santa Cruz Island, and Santa Barbara Island. Adding evidence to the case for continued resurgence of the species were hundreds of brown pelicans that initiated nesting at Pt. Lobos State Reserve, Monterey County during April and May 2000 (Terrill et al. 2000). The previous successful nesting there was in 1959 and the most recent attempt was in 1966. The possibilities exist that the species may re-establish small breeding colonies along the central California coast or colonize previously unutilized sites.

Nesting habitat consists of coastal islands just outside the surf line. A colonial nester, the brown pelican typically nests on small-to moderately sized islands to avoid predation by ground-dwelling species.

In the late 1960s and early 1970s, the reproductive success of brown pelicans declined considerably in California and northern Mexico. From 1969 to 1971, only 12 chicks fledged out of 2,368 nesting attempts (Gress et al. 1973, Anderson and Anderson 1976). The breeding failures of pelicans during this period were related to the high levels of DDE, the principal metabolite of DDT, in the marine environment (Schreiber and Delong 1969, Schreiber and Riseborough 1972, Jehl 1973, and Anderson 1976).

Reproductive success of brown pelicans can vary markedly from year to year. Changes in oceanographic conditions and in the distribution and abundance of forage fish are two interrelated factors that may account for this fluctuation.

Critical Habitat has not been designated for brown pelican.

Brown pelican uses the near-shore Pacific Ocean and the offshore rocks and islands of the California coast for roosting and loafing sites and nests offshore. Nesting habitat consists of coastal islands just outside the surf line. A colonial nester, the brown pelican, typically nests on small-to moderately sized islands to avoid predation by ground-dwelling species.

Brown pelican uses Humboldt Bay extensively during the non-breeding season for foraging, loafing, and roosting habitat. However, no nest sites for the species are known north of Monterey Bay.

Effects of the Proposed Action

Endangered Plants

The Ma-le'l Dunes CMA contains important habitat for both Humboldt Bay Wallflower and beach layia. Activities associated with the proposed action that have the potential to adversely affect these species include any activity that may cause ground disturbance within endangered plant areas. This includes the expansion of the existing trail system within the nearshore dunes and the anticipated increase in foot traffic in these areas upon implementation of the access plan, construction of the foot

bridge over the seasonal wetland, and the installation of signs within or adjacent to endangered plant areas.

Approximately 354 linear feet of new trail will pass through or immediately adjacent to (within 50 feet) endangered plant areas. Most of this "new trail" represents existing casual trails that pass through areas that support beach layia. Beach layia is locally abundant within the dune mat vegetation type on the North Spit, but it is also known to occur in lower densities within open sand areas such as the proposed trail alignment within the nearshore dunes of the CMA. Foot traffic in these areas has the potential to damage or destroy seed and/or reproductive individuals that occur in these locations or that may colonize in the future. Given the relatively high density of beach layia within the Humboldt Bay dunes, and on the North Spit in particular, adverse impacts to individuals that may inhabit the trail are not considered significant for the population as a whole.

The proposed trail alignment avoids all known occurrences of Humboldt Bay wallflower, however, it passes immediately adjacent to one significant occurrence of wallflower near the Ki-mak Trail at Ma-le'l North, and two smaller areas near the Latkak Trail at Ma-le'l South. The distribution map (Figure 4) shows the trail alignment abutting these locations; however, for clarification it should be noted that the trail directs foot traffic around these occurrences, and at Ma-le'l North, is positioned within a swale at the base of the dune that supports wallflower on its upland flanks.

Direct impacts to wallflower could result from pedestrians leaving the trail corridor and walking within areas where this species occurs, potentially crushing vegetative rosettes, seed, or reproductive individuals. Ground disturbance associated with off-trail foot traffic may also indirectly affect wallflower by causing degradation of suitable habitat areas (i.e. dune mat). The wallflower and beach layia may also establish near or within new or existing trails where an increase in ground disturbance associated with foot traffic may create open areas suitable for the establishment of these species, thus increasing the chance of mortality for those individuals. In addition, potential unauthorized pedestrian/equestrian access from the CMA to adjacent properties, including the Lanphere Unit of HBNWR, may have indirect impacts on rare plants that occur offsite.

The proposed alignment of the trail is considered the least damaging alternative to the Humboldt Bay wallflower, beach layia and associated dune mat habitat while providing consideration for the protection of sensitive cultural resources that also occur within the CMA. The areas where Humboldt Bay wallflower was observed growing near the proposed trail, and elsewhere throughout the CMA, are considered excellent habitat for the species. At Ma-le'l South, there are no known habitat limitations for the expansion of the wallflower on nearshore dunes, although it currently is not found there (pers. comm. Jennifer Wheeler June 16, 2006). Habitat limitations for the wallflower at Ma-lel' North include areas infested by invasive exotic species; however, these limitations would presumably be lifted once restoration activities are complete. The potential for individuals and seed of these species to be adversely impacted from the proposed action or the project alternatives, including the no action alternative, will continue to exist, and may increase as the populations increase in number and distribution within the CMA as a result of on-going restoration and resource management activities.

Although the proposed action is expected to result in an increase in public use of the beach and nearshore dunes, the action also provides for the consolidation of foot traffic by establishing a designated trail system through these sensitive habitat areas. The use of regulatory, boundary and directional trail signs, the decommissioning of various casual trails currently in use, and the monitoring of compliance of public use activities through caretaker presence, law enforcement patrols, and BLM/USFWS staff field visits, is expected to limit public access to endangered plant areas located within the CMA and the adjacent Lanphere Dunes Unit of HBNWR, thereby minimizing impacts to existing populations of Humboldt Bay wallflower and beach layia within the CMA and on

adjacent properties. In addition, through the monitoring of CMA resources and public use activities, BLM and USFWS resource managers will be able to identify where adaptive management strategies may be implemented to protect sensitive resources. This may include installing additional signage or decommissioning trails in areas where damage to natural resources is occurring because of authorized uses or unauthorized access to adjacent properties. Additional protections such as fencing was considered but was felt to be too difficult to maintain in the dune environment and was not compatible with the objectives of the public access plan, which was to minimize fencing throughout the area in order to retain the natural look of the area.

Potential impacts to rare plants from proposed construction activities will be avoided or minimized by incorporating the following measures: 1) oversight of all construction activities occurring within or adjacent to endangered plant areas by a CMA resource manager, 2) timing construction activities such as initial sign installation or bridge construction outside of the beach layia growing season to avoid impacting reproductive individuals, and 3) flagging all occurrences of Humboldt Bay wallflower rosettes located near construction areas prior to commencement of work, and the documentation of all adversely affected individuals by a CMA resource manager.

Furthermore, the USFWS shall implement a conservation measure for Humboldt Bay wallflower that involves seed collection and subsequent dispersal within newly restored areas of the Fernstrom-Root parcel. This measure is designed to facilitate the expansion of the wallflower within the CMA and mitigate for potential adverse impacts from off-trail foot traffic.

In summary, implementation of the proposed project is **likely to adversely affect** individuals and/or seed of beach layia and Humboldt Bay wallflower; however, with the incorporation of minimization and conservation measures, the proposed project is not likely to adversely affect the range-wide populations of beach layia or Humboldt Bay wallflower or existing colonies within the Action Area.

Western Snowy Plover

Although the status of western snowy plover within the CMA is unknown due to inadequate survey effort, suitable breeding habitat for plovers does occur in the back dunes. In addition, it is possible that current restoration and European beachgrass eradication activities will increase open sand in the nearshore dunes near the project area and may improve the habitat for western snowy plover. Therefore, the proposed project **may affect but is not likely to adversely affect** western snowy plover. Should monitoring efforts reveal the presence of plovers in the CMA during the breeding season, BLM and HBNWR will immediately coordinate with USFWS to determine appropriate protection measures, which would utilize the most current methodologies for plover protection. BLM and HBNWR will also reinitiate consultation if ongoing activities may affect the species.

California Brown Pelican

Suitable breeding habitat for California brown pelican does not occur within the Ma-le'l Dunes CMA and the species is not known to nest anywhere north of Monterey Bay. Therefore, activities associated with the proposed Ma-le'l Dunes Public Access Plan will have **no effect** on California brown pelican.

Cumulative Effects

An undetermined number of future state, Tribal, local or private actions not subject to federal authorization or funding could alter the habitat for and/or increase incidental take of Humboldt Bay wallflower, beach layia, and western snowy plover.

Current and future projects reasonably certain to occur within the action area include restoration activities that are subject to federal authorization or funding and would therefore be covered under an HCP or subject to Section 7 consultation. Both the BLM and the USFWS plan to continue restoration work and weed eradication efforts within the CMA with the assistance of contracted labor, such as the California Conservation Corps and Friends of the Dunes restoration programs. In addition, USFWS will implement restoration activities throughout the nearshore dunes and forest at Ma-le'l North over the next five years with funding from the California Department of Corrections. These projects would not be considered in the cumulative effects analysis; however, activities associated with these projects are not expected to adversely impact listed species. In contrast, they are likely to have a beneficial effect to listed species by restoring essential habitat.

Analysis of Alternative Actions

Alternative B: Multi-Use Throughout and Additional Improvements

Alternative B is similar to the proposed action (Alternative A) in allowing public use throughout the Ma-le'l Dunes CMA, but it would also provide the following additional improvements:

Public Uses:

- Continued and increased off-leash dog walking would be allowed at Ma-le'l North (in addition to Ma-le'l South).
- Equestrian use would also be allowed on the northern portion of the proposed Latkak trail.
- Bicycling riding would be allowed throughout the Ma-le'l Dunes CMA.
- Off-trail pedestrian use would be allowed at Ma-le'l South.
- Off-trail vegetative gathering would be allowed at Ma-le'l South.

Access Infrastructure:

- A pedestrian trail connecting the Ma-le'l South and Ma-le'l North properties through the nearshore dunes would be delineated and marked.
- The access road and parking areas (Ma-le'l South and Ma-le'l North) would be paved with asphalt.

Analysis of Alternative B

The additional public uses associated with this alternative are likely to result in greater impacts to sensitive biological resources within the nearshore dunes compared to the preferred action. In allowing off-leash dog walking at Ma-le'l North, ground disturbance from foot traffic within sensitive habitat areas is likely to be greater since unleashed dogs are not as easily controlled or directed as leashed dogs, and pedestrians may find it necessary to venture outside of the trail corridor to retrieve wandering companions. Opening the northern portion of the Latkak Trail on Ma-le'l south for equestrian use may similarly result in an increase in ground disturbance within the nearshore dunes by establishing a wider trail corridor to accommodate the horses. Extending the equestrian trail also reduces the buffer between existing equestrian use areas and sensitive habitat areas further north where this activity does not occur.

Connecting Ma-le'l South and Ma-le'l North with a pedestrian trail through the nearshore dunes would likely result in greater impacts to endangered plant populations and native dune mat habitat as opposed to the preferred action, which directs pedestrians to walk northward along the wave slope from the end of the Latkak Trail at Ma-le'l South to access the Ki'mak Trail at Ma-le'l North (or visa versa). By directing pedestrians to use the wave slope as opposed to the nearshore dunes, ground disturbance associated with foot traffic is diverted away from habitats that support endangered plant populations. Similarly, allowing off-trail pedestrian use and off-trail vegetation gathering at Ma-le'l South is likely to increase ground disturbance in the sensitive nearshore dune habitats where the rare plants occur.

Alternative C: Protection and Restoration

Alternative C would have the common features of the Plan Alternatives but would limit public use throughout the entire Ma-le'l Dunes CMA to pedestrian use only with permit and via docent-let tours and restoration workdays. Specifically, the proposed actions of Alternative C would include the following:

Public Use

- The day use/picnic area located at Ma-le'l South and trails currently designated as beach hiking trails at Ma-le'l South would continue to be open to the public for pedestrian use. Forest hiking trails and beach trails currently used for equestrians and dog walking at Ma-le'l South would be closed to these uses and would be only available for pedestrian use by permit and via docent-led tours and field trips. Ma-le'l North would only be open for docent-led pedestrian use, tours, and field trips.
- The gates to Ma-le'l North would be locked at all times, and accessible only by key for authorized activities (e.g., guided walks, restoration activities, and gathering by the Wiyot).

Access Infrastructure

- A maintenance plan for the access road would be prepared and implemented but the road would not be improved.
- A coordinated signing program limited to the provision of an entry, boundary/no trespassing, and regulatory signage would be designed and implemented.

Analysis of Alternative C

No adverse impacts to federally listed species were identified under Alternative C. Limited public access allowed by special permit and via docent-led tours and field trips is expected to provide for the protection of biological resources by ensuring that visitors to the CMA avoid endangered plant populations and sensitive habitat areas. Limiting public access, along with continued management of the CMA through habitat restoration, is expected to benefit populations of Humboldt Bay wallflower and beach layia more than the preferred action.

Alternative D: No Action

In the No Action alternative the current situation as described under Site History and Current Uses in the Access Plan would continue. Specifically, interim improvements and management at Ma-le'l South would continue and pedestrian trails and beach access through the nearshore dunes would not

be extended. Access to Ma-le'l North would continue to be limited to monthly walks by special permit and restoration workdays. In addition, pedestrian trails and beach access throughout the nearshore dunes of Ma-le'l North (where biological species of concern and cultural resources are present) would not be delineated or marked. Parking at the Pacific, Gas & Electric power tower trail would continue to pose potential pedestrian–vehicular conflicts. The access road to Ma-le'l North and associated parking lot would not be improved and signage would not be installed. Trails throughout the forest and to beach access points would remain unmarked and unsigned.

Analysis of Alternative D

The No Action Alternative was considered and analyzed but determined to be inconsistent with cooperative management goals identified by the BLM and USFWS for the Ma-le'l Dunes CMA, which are to protect the natural and cultural resources of the area and provide safe public access throughout the CMA.

Under Alternative D sensitive habitat areas and endangered plant populations located within Ma-le'l North would not be afforded the same protection because the signing program, fencing, decommissioning of casual, monitoring of compliance through caretaker presence proposed under Alternative A would not be implemented. Illegal entry to Ma-le'l North would continue to pose a potentially significant threat to biological resources because illegal visitors would continue to use a vast network of casual trails throughout the CMA and encourage further "trail blazing" throughout the site by visitors. This is an unmitigated potentially significant impact. Existing public uses at Ma-le'l South would continue, however, biological resources would be less protected because of the lack of caretaker presence.

Conclusions and Determinations

Humboldt Bay Wallflower

The project activities associated with the Ma-le'l Dunes Public Access Plan are **likely to adversely affect** individuals of Humboldt Bay wallflower; however, project activities are not likely to adversely affect the CMA or range-wide population of Humboldt Bay wallflower with incorporation of minimization and conservation measures. The State Coastal Conservancy will request concurrence from the U.S. Fish and Wildlife Service.

Beach Layia

The project activities associated with the Ma-le'l Dunes Public Access Plan are **likely to adversely affect** individuals of beach layia; however, project activities are not likely to adversely affect the CMA or range-wide population of beach layia with the incorporation of minimization measures.

Western Snowy Plover

The project activities associated with the Ma-le'l Dunes Public Access Plan are **not likely to adversely affect** western snowy plover.

California Brown Pelican

The project activities associated with the Ma-le'l Dunes Public Access Plan will have **no effect** on California brown pelican.

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APPENDIX C: MITIGATION AND MONITORING PROGRAM

INTRODUCTION

This Mitigation Monitoring Program was developed for the Mitigated Negative Declaration which was prepared for the Ma-le'l Dunes Cooperative Management Area Public Access Project pursuant to the California Environmental Quality Act (CEQA).

Section 15097 of the Guidelines for CEQA requires a program for mitigation monitoring or reporting when a public agency adopts a mitigated negative declaration in conjunction with approving a project. The purpose of the Mitigation Monitoring Program is to ensure that the mitigation measured outlined in the Initial Study for avoiding potential significant impacts are implemented.

The landowners and managers, the Bureau of Land Management and the Fish and Wildlife Service will monitor project implementation to ensure that mitigation measures are being incorporated.

Mitigation Measure 1:
Planned improvements would occur during the dry season in seasonal wetlands and would incorporate Best Management Practices (BMPs) to control sediment transport, such as conducting work during low tide, and use of silt fencing if necessary.

Timing for Implementation/ Compliance: During construction phase
Person/ Agency Responsible for Monitoring: Contractor, USFWS, BLM
Monitoring Frequency: Continuous during period of construction
Evidence of Compliance: Lack of turbidity in adjacent waters upon visual inspection

Mitigation Measure 2:
During the breeding season for birds likely to breed in the Ma-le'l Dunes Cooperative Management Area (CMA) (February 15 to August 15), construction activities and routine maintenance would utilize only non-mechanized equipment. Only hand tools and clippers would be allowed during this period, except to address emergency and/or public safety conditions when mechanized equipment would be allowed. The use of mechanized equipment within the breeding season for birds likely to breed in the Ma-le'l Dunes CMA to address emergency conditions would be conducted at the discretion of the Ma-le'l Dunes CMA managers.

Timing for Implementation/ Compliance: During breeding period February 15 to August 15.
Person/ Agency Responsible for Monitoring: Contractor, USFWS, BLM
Monitoring Frequency: Prior to scheduling of construction activities or routine maintenance.
Evidence of Compliance: Log of activities and maintenance conducted, date, and type equipment used.

Mitigation Measure 3:
The USFWS will implement Humboldt Bay wallflower seed collection from existing populations on the adjacent Lanphere Dunes Unit, and subsequent dispersal within newly restored areas of the Fernstrom-Root and Ma-le'l parcels. This measure is designed to facilitate the expansion of the wallflower within the CMA and mitigate for potential adverse impacts from off-trail foot traffic. The refuge will obtain a recovery permit.

Timing for Implementation/ Compliance: During the first season of operation of the CMA.
Person/ Agency Responsible for Monitoring: USFWS
Monitoring Frequency: To be determined by USFWS
Evidence of Compliance: To be determined by USFWS

Mitigation Measure 4:
All construction activities occurring within or adjacent to endangered plant areas would be supervised by Ma-le'l Dunes CMA resource managers and would take place outside of the growing season to avoid impacts to reproductive individuals. In addition, before the commencement of work and when species are clearly visible all occurrences of Humboldt Bay wallflower rosettes (reproductive season is approximately March 1 through the end of the summer), beach layia (reproductive season is March to May), Humboldt Bay owl's-clover (reproductive season is May through July), Point Reyes bird's-beak (reproductive season is approximately June 1 through end of summer), and other rare plant species located near construction areas would be flagged and the CMA resource managers would document any adversely affected individuals.

Timing for Implementation/ Compliance: Prior to commencement of construction activities
Person/ Agency Responsible for Monitoring: USFWS, BLM
Monitoring Frequency: Prior to initiation of any construction activity
Evidence of Compliance: Visual or written verification that no endangered species were disturbed.

Mitigation Measures 5:
One hundred and seventy-five square feet (175 sf) of high salt marsh habitat (6.4 to 8.9 feet above mean-low-low-water) that is dominated by dense-flowered cordgrass (*Spartina densiflora*) would be restored with pickleweed (*Salicornia virginica*) and saltmarsh (*Distichlis spicata*) and maintained as such as mitigation for the installation of the canoe/kayak landing/launching ramp.

Timing for Implementation/ Compliance: Mitigation for loss of wetland habitat would begin immediately following the construction of the ramp.
Person/ Agency Responsible for Monitoring: USFWS
Monitoring Frequency: Prior to, upon completion of construction activities
Evidence of Compliance: One hundred and seventy five sf of high salt marsh dominated by pickleweed and saltgrass.

Mitigation Measures 6:
The development of a maintenance program for the forest trails in Ma-le'l North to insure that routine vegetation clearing does not adversely affect locally rare plants identified by the CMA resource managers.

Timing for Implementation/ Compliance: Prior to the commencement of any vegetation clearing along the trails or routine maintenance.
Person/ Agency Responsible for Monitoring: USFWS
Monitoring Frequency: Annually, when routine maintenance along forest trails occurs.
Evidence of Compliance: Visual inspection that no rare plants were disturbed.

Mitigation Measure 7:
In the event any undiscovered paleontological, archaeological, ethnic, or religious resources are encountered during grading or construction-related activities, in compliance with the state and federal law, all work within 100 feet of the resources shall be halted and the Plan applicants shall consult with a registered professional archaeologist and designated representative of the Wiyot Tribe to assess the significance of the find and formulate further mitigation. This would include coordination with the Native American Heritage Commission. The Native American Heritage Commission would contact the Wiyot Tribe, as deemed necessary, to assist in assessing the significance of any find. If any find is determined to be of significance, the USDI-BLM and FWS, and a qualified archaeologist would meet to determine the appropriate course of action. Pursuant to the California Health and Safety Code Section 7050.5, if human remains are encountered, all work would cease and the County coroner would be contacted. The county coroner and Native American Heritage Commission would be charged with determining if the human remains are of Native American origin.

Timing for Implementation/ Compliance: During all ground disturbing activities and/or during course of operation of the CMA.
Person/ Agency Responsible for Monitoring: USFWS, BLM, Wiyot Tribe
Monitoring Frequency: Continuous during grading and ground disturbing construction related activities.
Evidence of Compliance: Visual or written verification that no cultural resources were found and/or disturbed.

Mitigation Measure 8:
Cultural monitors will be present during initial, native soil disturbance activities that occur at locations mutually agreed upon by the Wiyot Tribe, USFWS, and BLM (as necessary) as areas of the greatest concern.

Timing for Implementation/ Compliance: During all such ground disturbing activities and/or during course of operation of the CMA.
Person/ Agency Responsible for Monitoring: USFWS, BLM, Wiyot Tribe

Monitoring Frequency: Continuous during such grading and/or ground disturbing construction-related activities.
Evidence of Compliance: Visual or written verification that cultural monitors were present during such ground disturbing activities.

Mitigation Measure 9:
Regulatory signing would state that in accordance to state law, destruction, and defacement of historical objects (Penal Code 655-1/2 and relevant federal law) and removal of human remains (PRC 5097.5, PRC 70550.5, and relevant federal law) is a punishable crime. Undesignated canoe and kayak landings located on the slough and within the project boundary would be re-vegetated and signed "No Landing/Re-vegetation in Progress."

Timing for Implementation/ Compliance: Prior to opening the area for public access.
Person/ Agency Responsible for Monitoring: USFWS, BLM, Wiyot Tribe
Monitoring Frequency: Once to review draft sign language; once upon completion to assure compliance.
Evidence of Compliance: Signs referencing said state and federal laws are installed at CMA public access entry points and signs stating "No Landing/Re-vegetation in Progress" are installed at undesignated boat landings.

Mitigation Measure 10:
USFWS, BLM (as necessary), and the Wiyot Tribe would work collaboratively with a registered professional archaeologist to prepare a baseline review of the cultural resources that the Tribe and agency staff mutually agrees upon as the areas of greatest concern. Thereafter annual review with a registered professional archaeologist or designated representative of the Wiyot Tribe would occur. Furthermore, Ma-le'l Dunes CMA managers would conduct regular monitoring to ensure against vandalism of cultural resources within mutually agreed upon areas of greatest concern. Results of cultural resources monitoring would be conveyed to the appropriate agencies.

Timing for Implementation/ Compliance: Prior to opening the area for public access.
Person/ Agency Responsible for Monitoring: USFWS, BLM, Wiyot Tribe
Monitoring Frequency: As agreed upon by federal agencies and Wiyot Tribe
Evidence of Compliance: Regular written verification that monitoring has been conducted and conveyance of results to Wiyot Tribe.